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USSR MINISTRY OF GEOLOGY SETS SOCIALIST PLEDGES FOR 1983

Moscow RAZVEDKA I OKHRANA NEDR in Russian No 4, Apr 83 pp 1-4

/Article: "Socialist Obligations of the Collectives of the Organizations and Enterprises of the USSR Ministry of Geology for 1983"/

/Text/ The collectives of the organizations and enterprises of the USSR Ministry of Geology, in implementing the decisions of the 26th CPSU Congress and having undertaken a socialist competition to provide a worthy contribution to the celebration of the 60th Anniversary of the formation of the USSR, has fulfilled their assignments and socialist obligations for 1982 ahead of schedule. These tasks included an increase in the amount of explored reserves of all types of minerals, which ensure the further strengthening of the Soviet Union's mineral and raw material base.

The raw material base of the petroleum and gas industry has been significantly expanded. Exploration of the major Bovanenkovskoye natural gas deposit in West Siberia has been completed. Reserves of gas, condensate and sulphur at the experimental operating section of the Astrakhan gas condensate deposit have been proven. An industrial evaluation has been provided for the reserves of the Karachaganakskoye deposit in the Kazakh SSR. Reserves of coal amounting to 6.6 billion tons, including 584 million tons in the Kuznetsk and Southern Yakutsk basins, have been prepared for mining. The raw material base of the ferrous and nonferrous metals industries has been improved and expanded; in particular, this concerns facilities for the Kostomukshskoye ore enrichment combine in the Karelian ASSR, the Leninogorsk polymetal combine at Rudnoy Altay, and the Khaydarkanskoye mercury combine in the Kirghiz SSR.

In the process of realizing the USSR Food Program we have succeeded in increasing reserves of phosphate raw material at Khibiny and Karatau; and the importance of new phosphorite deposits in the Uzbek SSR and the Estonian SSR and of potassium salt in East Siberia has been established. Some 275 deposits of peat in the RSFSR Non-Chernozem have been explored. Large reserves of underground water for agricultural facilities have been found. The network of subsidiary farms has been expanded; and the production of meat, milk and vegetables has been increased.

The prospectors from all union republics have made an important contribution to the development of the Soviet Union's raw material base. The fact that twelve of the best collectives were presented with the Challenge Red Banner of the CPSU Central Committee, the USSR Council of Ministers, the All-Union Central Trade Union Council and the Komsomol Central Committee for their results in the All-Union Socialist Competition to commemorate the 60th Anniversary of the USSR attests to the high evaluation that was given to their labor successes.

The workers of the sector organizations and enterprises were quite pleased with the decisions of the November (1982) Plenum of the CPSU Central Committee and with the attitudes and conclusions that were outlined in General Secretary Andropov's speech at the Plenum. They have undertaken efforts to further improve the organization of labor, to strengthen labor and production discipline, to conserve materials, equipment and fuel and energy resources, and to make use of internal reserves for increasing labor productivity. And they have joined in the competition to successfully fulfill and overfulfill the assignments of the State Plan for the Economic and Social Development for 1983. The collective of the PGO /Production and Geological Association/ Khantymansiyskneftegazgeologiya /Khanty-Mansiysk petroleum and gas prospecting administration/ was the initiator of the competition to fulfill the 1983 plan ahead of schedule.

The workers, engineers, technicians and office workers of the USSR Ministry of Geology have made the following socialist pledges for 1983:

To further develop the Soviet Union's mineral and raw material base

To overfulfill without additional funding the annual plan for the growth in explored reserves of minerals:

fuel and energy complex - oil and condensate by 6.3 percent, natural gas by 29.4 percent, and the capacities of the coal mines by 3.2 percent;

solid minerals - manganese ore by 9 percent, copper by 3.8 percent, zinc by 3.5 percent, natural sulphur by 4.5 percent, molybdenum by 6.2 percent, tungsten by 4.3 percent, Iceland spar by 5 percent, iron ore, chrysotile asbestos and rock crystal by 2 percent, and fluorspar by 1.7 percent.

To fulfill ahead of schedule, by the start of the 66th Anniversary of the October Revolution:

planned assignments for the first three years of the five-year plan for the explored reserves of iron ore and increase in the capacities of coal mines of the RSFSR Ministry of Geology, and increase in reserves of natural gas for the Uzbek SSR Ministry of Geology;

annual plans for increasing reserves of molybdenum, nickle, chrysotile asbestos, apatite and fluorspar; natural gas, iron ore and zinc for the Kazakh SSR Ministry of Geology, copper, lead and zinc for the Administration of Geology of the Armenian SSR;

transfer three gas deposits, 15 productive oil and gas wells and two coal mines with a total capacity of four million tons per year to active production in the Ukrainian SSR.

Within the USSR State Committee for Stockpiling Useful Minerals establish coal reserves amounting to 50 million tons in excess of the plan in the Ukrainian SSR, 14 million tons of brown coal from the Tikhmenevskoye deposit in Sakhalin Oblast, and 10 million tons of coking coal from the Tentekskoye deposit in the Kazakh SSR.

Complete the preliminary exploration of the Ust'yanskoe mine of the Abanskoye deposit with reserves of nine billion tons of coal in the Kansk-Achinsk basin two months ahead of the established time period.

To speed up the scientific-technical progress, raising quality, the efficiency of prospecting work, and improving technical-economic indicators

Complete not less than 80 percent of scientific research and experimental design work, which are to be accomplished in accordance with the assignments of the State Plan for the Economic and Social Development of the USSR, the target comprehensive and scientific-technical programs with ratings of good and excellent.

By improving the organization of labor and the efficiency of labor within the scientific-research institutes of the sector we pledge to accomplish the following in excess of the plan:

to complete a comprehensive evaluation of the predicted resources of useful nonferrous metals within the Soviet Union's territorial production complexes according to materials which predict such reserves within the USSR;

compile a geochemical justification for measures and a series of specialized maps for protecting the environment and a general plan for the development of the city of Moscow;

provide a geological-economic evaluation of coal reserves in Central Asia and develop recommendations for assimilating deposits to meet the needs of the national economy of the republics for their own fuel;

prepare a copyrighted alternate of a map of the USSR's exogenous metallogeny on a scale of 1:5,000,000;

estimate the resources of oxidized salts within the Kansk-Achinsk coal basin in order to use them as fertilizers in the agriculture of the South Siberian region;

develop a technological process for obtaining synthetic diamonds of a new grade with an improved durability and resistance to heat.

Complete not less than 11 percent of the concluding scientific-research and design projects by 7 November 1983, ahead of schedule, to include:

provide a quantitative evaluation of the prospects for the presence of oil and gas in Siberia;

compile a map in the scale of 1:2,500,000 for the secondary phosphorites in Siberia and the Far East;

study the substantive composition, agrochemical properties and evaluate the resources of a new type of raw material - vivianite-peat in Novosibirsk Oblast.

Without additional funding we pledge to overfulfill the plan for satellite mapping on a scale of 1:1,00,000 - 1:500,000 by five percent and infrared-heat photography by 10 percent.

To improve the scientific-methodological and technical quality of prospecting work we pledge to:

overfulfill by 8 percent the plan for seismic work for oil and gas using digital stations, the automatic processing of recordings and the adoption of nuclear geophysical methods for testing soil and ore in their natural environment;

complete one year early the acceptance tests of equipment for drilling with a hydraulic transporter of a core to a depth of 300 meters and acceptance tests of the K-02SV bits for drilling with explosive charges with retrievable core receivers at coal deposits;

overfulfill the established assignments for drilling deep exploration wells for oil and gas using rolling-cutter drilling bits with a hermetically sealed oil-filled support by five percent; prospecting bore holes for solid minerals and water using a core hydraulic transporter by eight percent; diamond tool at high rpm of the drilling charge with bits, reinforced synthetic diamonds, and a diamond tool using high frequency hydraulic hammers by two percent;

adopt not less than 120 inventions and 29,000 rationalization proposals, realizing an economic savings from their adoption of 38 million rubles;

as compared with 1982 increase the number of brigades that are:

functioning on the brigade contract method for deep drilling, derrick building and in testing wells by not less than 10 percent, in prospecting drilling by five percent, in ore prospecting work by 13 percent and in geophysical work by seven percent;

functioning at levels established within the sector for the 11th Five-Year Plan, for deep exploratory drilling for oil and gas by eight percent, for prospecting drilling by five percent, and for ore prospecting work by 12 percent.

Through the adoption of new equipment, progressive technology and improving the organization of work, the continued dissemination of advanced experience and the brigade contract increase the average per-brigade amount per year for deep drilling by five percent as compared with the level achieved in 1982, to overfulfill the assignment for increasing the speed of deep drilling by 12 percent, exploratory drilling for solid minerals and water by 15 percent, and the footage of underground mine workings by 20 percent.

Through the conserving of resources, the adoption of new energy saving equipment and other organizational-technical measures to conserve as opposed to established norms for the expenditure of 1,700 tons of rolled ferrous metals, 10,000 tons of steel pipe, 7,500 tons of cement, 8,000 cubic meters of lumber, 25 million kilowatt-hours of electricity and 40,000 tons of standard fuel. Through the use of the material technical resources that are conserved we pledge to drill 50,000 meters of deep wells for oil and gas, 270,000 meters of column wells and to drill 500 meters of mine workings.

To manufacture and realize in excess of the plan at plants of the sector an industrial product amounting to 530,000 rubles. And to obtain one million rubles in excess of plan profit.

For realizing the USSR Food Program

Overfulfill the plans for increasing the reserves of phosphorites by five percent, apatite by 2.3 percent, including for the Kazakh SSR Ministry of Geology - phosphorites by five percent, for the Ukrainian SSR Ministry of Geology - apatite by five percent. To overfulfill the plan for prospecting peat deposits in the RSFSR Non-Chernozem by 5.7 percent.

In excess of the established plan provide for large-scale, comprehensive hydrogeological and engineering-geological photography for purposes of reclaiming some 1,000 square kilometers of land and to prospect and approve in the USSR State Commission for Stockpiling Useful Minerals and the Territorial Commission for the Stockpiling of Useful Minerals within three years of the five-year plan the reserves of underground water for irrigation amounting to 4.3 million cubic meters per 24-hour period against a five-year assignment of seven million cubic meters per 24-hour period; to transfer to agriculture some 600 wells that have been drilled in the process of prospecting work and which found underground water that is suitable for a water supply.

At our subsidiary farms we pledge to produce not less than 3,900 tons of meat, 2,500 tons of milk, 7,600 tons of potatoes and vegetables, and 9,500 tons of grain.

For the Social Development of the Collectives

We pledge to improve working conditions for not less than 14,000 men.

By 25 December, ahead of schedule, we pledge to put into operation using all available sources of financing (without a shared participation) some 630,000 square meters of housing units and pre-school institutions for some 4,700 children.

We pledge to provide training for 1,100 workers and 1,500 managers and engineers and technicians in excess of the established plan.

We pledge to overfulfill the annual retail goods turnover plan by three million rubles.

By improving working and living conditions we pledge to reduce labor turnover by 3.7 percent as compared with 1982.

We pledge to enlarge the sports facilities of the organizations and enterprises thereby increasing by 5.3 percent the number of workers who engage in sports and physical culture.

In implementing the decisions of the November (1982) Plenum of the CPSU Central Committee, we pledge to reduce the losses of work time by 7.8 percent by improving the organization of labor, the training within the collective of a conscious labor discipline, the reduction of officially approved absences and unapproved absences, and to increase the volume of column drilling without increasing the number of drilling brigades.

The workers of the organizations and enterprises of the USSR Ministry of Geology assure the CPSU Central Committee that they will further expand the socialist competition to fulfill the 1983 plan ahead of schedule and the 11th Five-Year Plan overall and that they will apply themselves diligently, giving all of their experience and energy to successfully implementing the decisions of the 26th CPSU Congress and the November (1982) Plenum of the CPSU Central Committee.

The socialist obligations were discussed and accepted within the collectives of the organizations and enterprises of the sector; they were then approved by the Collegium of the USSR Ministry of Geology and the presidium of the Central Committee of the Trade Union of the Workers of Geological Prospecting.

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CEMA NATIONS COLLABORATE IN DEALING WITH OIL, GAS WELL BLOWOUTS

Moscow EKONOMICHESKOYE SOTRUDNICHESTVO STRAN-CHLENOV SEV in Russian No 6, 1983 pp 35-36

[Article by Zoltan Tot, CEMA Secretariat: "The Prevention and Elimination of Oil and Gas Blowouts"]

[Text] Against a background of progress in equipment and technology for the deep drilling of oil and gas wells, the urgency of problems connected with the prevention and elimination of oil and gas blowouts not only is not reduced but even grows, especially with the trend toward the larger amounts of deep drilling that are now being observed and the requirement for increased quality in making hole that is connected with this increase.

The problem of uncontrolled blowouts of oil or gas is one of the most complicated of problems. It is accompanied by danger to people's lives, great material losses, and undesirable losses of oil and gas reserves.

Experience in deep drilling indicates that a blowout can occur when drilling through zones of anomalously high formation pressures if the density of the drilling mud becomes inadequate for controlling the pressure differential in the well. Most open blowouts occur during round-trip operations and usually result from a piston-like effect when the drill string is raised or from pumping inadequate amounts of drilling mud into the well.

Modern technical means for averting blowouts cannot in and of themselves insure work safety. Well-trained specialists who know how to confidently manage and carry out the necessary operations are needed.

It is not simple to solve the problem of preventing and eliminating blowouts. Acquisition of the essential scientific, technical and operating potential is presupposed. Based upon these considerations, an agreement has been concluded among five CEMA member nations--the People's Republic of Bulgaria, the Hungarian People's Republic, the GDR, the Polish People's Republic and the Czechslovak Socialist Republic--on the problem, "The Elimination and Prevention of Complicated Well Emergencies and Oil and Gas Blowouts," which went into effect 7 September 1977. The coordinator of the Special Emergency Service (SAS) is a Hungarian organization--the Rescue Center of the State Trust for the Oil and Gas Industry (OKGT)--which is known hereinafter as the Rescue Center.

The SAS's basic tasks consist in preventing oil and gas blowouts during well drilling, studying the formations and preventing and eliminating the further spread of environmental pollution (including hydrogen sulfide and carbon dioxide), as well as eliminating complicated breakdowns and oil and gas blowouts, with or without ensuing fires.

Eight meetings of the Council of Representatives, six conferences of experts and three joint exercises at test wells were held and teaching and briefings in the techniques of eliminating oil and gas blowouts from wells were given within the framework of the agreement prior to the end of 1982. In order to process and generalize experience in eliminating blowouts with the collaborating parties, data on discharges that have already occurred were selected. This material was analyzed by the Rescue Center and sent to the countries participating in the agreement.

A unified course for training emergency-rescue services workers has been prepared within the framework of the agreement. This is a specialized school for training and instruction in safety measures during rescue operations. The training course calls for 4 days of training for all personnel who work at oilfield facilities of the participating nations. Moreover, unified rules for safety procedures during the elimination of complicated emergencies and oil and gas blowouts have been prepared. They were compiled to take into account the legislation, decrees, standards and regulations that exist in the countries that are participating in the agreement.

The Rescue Center has analyzed the well-framing members that are being used on the land of the countries that are party to the agreement. The prerequisites for an official exchange of well fixtures and similar special fixtures have been established. For purposes of unimpeded movement across state borders of the countries that are party to the agreement, there is an understanding about the adoption of special measures. Upon receipt of a request for rescue organizations that extend assistance where there are oil or gas blowouts, the international agreement provides for priority in hauling the specialists and equipment of the indicated organizations.

Lists of resources for individual protection have also been prepared. Special clothing for the protection of SAS workers against high temperatures has been created. SAS detachments of countries party to the agreement have been equipped with gas-sensitive instruments that detect dangerous concentrations of asphyxiating and toxic gases. Devices for extinguishing the flame of a well's gas flare during a fire at a gas or gas-and-oil blowout have been developed that will let the flare be eliminated remotely in 1-2 seconds from a distance of 5-10 meters. The results obtained will enable devices of a similar type to be recommended for production use when extinguishing burning gas blowouts with flows of 2-4 million tons per day.

Proposals on the unification and modernization of equipment, vehicles, technical resources, instruments and items for personal protection that are used by emergency-rescue organizations of the countries party to the agreement are being reviewed.

SAS specialists are now compiling a dictionary in Russian and in the languages of the countries party to the agreement that will include words and phrases that are used during operations to eliminate complicated emergencies and blowouts.

Joint training exercises have been held at training grounds in Hungary, the GDR and Poland in order to perfect means for reducing the time taken to eliminate blowouts and to increase safety for workers. During the joint training, different types of oil and gas blowouts have been created whose characteristics were close in physical parameters to those of natural blowouts and fires.

Since the day the agreement was signed, national emergency-rescue detachments have been established and developed in the participating countries, and theoretical and practical training has been conducted with the use of a large number of didactic methods. Each year, on the average, about 400 people have been trained directly at drill rigs and during special courses and training exercises.

During the collaboration period, Hungary's SAS has extended help in suppressing and eliminating two gas-and-oil blowouts. In both instances, the blowouts were eliminated in 3-4 days. Each year 5-6 blowouts that occur at oil and gas field facilities of the countries party to the agreement are eliminated by national rescue-brigade personnel. Since the agreement has been in effect, there has not been one blowout that could not be suppressed, including natural disasters.

Tasks set for the collaborating organizations are being performed successfully within the framework of the agreement. In the past 5 years much experience has been gained in organizing rescue work and in preventing oil and gas blowouts, experience that helps to improve the work and to raise the skills and readiness of drilling personnel in preventing and eliminating blowouts.

11409
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CEMA NATIONS' DATA SYSTEMS ON OIL, GAS INDUSTRY BEING AUTOMATED, UNIFIED

Moscow EKONOMICHESKOYE SOTRUDNICHESTVO STRAN-CHLENOV SEV in Russian No 6, 1983 pp 36-38

[Article by Vladimir Kornev, supervisor of the [Informneftegaz] System's Working Staff, manager of a VNIIOENG [All-Union Scientific-Research Institute for Organizing the Management and Economics of the Oil and Gas Industry] sector, and Mikhal Kuchala of the CEMA Secretariat: "'Informneftegaz': The Results of a Five-Year Collaboration"]

[Text] The level and pace of scientific and technical progress in all branches of the national economy depend greatly upon how completely and timely everything that is new and advanced in science and production finds expression and with what precision the managerial decisions that are adopted correspond to the most modern requirements. Because of this, the role of the scientific and technical information services, which provide scientific-research and design-development organizations and industrial-production facilities with the information they need, has grown substantially.

The volume and sources of information throughout the world are constantly being increased, and, as a consequence, the prerequisites for collecting and processing information are becoming more complicated and costs for servicing customers are rising. The advantages of the fraternal countries of socialism and their constantly expanding and deepening economic integration are enabling them to solve jointly many scientific and technical questions, including the problem of increasing the level of information output for science and production in CEMA member countries.

The interaction of these countries in this area is being realized on the basis of a unified international system of scientific and technical information that comprises a set of subsystems: international specialized informational systems, and international branch-of-industry systems for scientific and technical information (MOSNTI). The latter also includes the MOSNTI 'Informneftegaz' (hereinafter the System), which is functioning and being developed within the framework of the Standing Commission on Collaboration in the Area of the Oil and Gas Industry.

It was formed in 1975 in accordance with a decision of the 42d Session of the Commission. National organs of scientific and technical information of the

oil and gas industry of all the European CEMA member nations have joined it as partners that have equal rights. Since 1980, the Republic of Cuba has become a part of the System.

The Commission, at its 43d Session, approved the Basic Principles of the System and named the All-Union Scientific-Research Institute for Organizing the Management and Economics of the Oil and Gas Industry (VNIIOENG) of the USSR Ministry of Oil Industry as the prime organ. Detached national organs (VNO's) from the countries involved have begun to participate in the System's work: the Committee for Geology from the BNR [People's Republic of Bulgaria]; the State Trust for the Oil and Gas Industry from the MNK [Hungarian People's Republic]; the Fuel Institute and the Scientific-Research Institute for the Exploration and Recovery of Oil and Gas from the GDR; the Institute for Mineral Oil Affairs and Gas from the PRL; the Research and Design Institute for Oil and Gas from the RSR [Socialist Republic of Romania]; the All-Union Scientific-Research Institute for the Economics, the Organization of Production and Technical and Economic Information in the Gas Industry from the USSR; and the Scientific-Research Institute for Fuels from the CSSR [Czechoslovak Socialist Republic]. The Republic of Cuba has assigned the National Center for Information of the Ministry of Basic Industry to participate in the work.

With the forming of the System, the following tasks were set for it:

to raise the effectiveness of information support for the CEMA member nations' oil and gas industry customers;

to eliminate duplication in the collection and processing of information, based upon use of the advantages of the international socialist division of labor;

to assist in developing national branch systems of scientific and technical information for the oil and gas industry; and

to create a unified automated information retrieval system for the oil and gas industries of CEMA member nations.

During the first stage of development of the System, the main attention was devoted to questions of organizing it, determining its topical direction, and developing the paperwork necessary to support its functioning. The Council of the MOSNTI Informneftegaz, which consists of representatives of countries that are participating in the System, and also the Working Staff of the prime organ have been organized.

Since 1978 the VNO's have undertaken joint informational activity, particularly in the issuance of topical surveys on urgent problems of the oil and gas industry, and the national branch systems have promoted a mutual exchange of informational papers.

In order to create a unified informational base, using modern methods and computer equipment, the VNO's began that same year to develop automated information-retrieval systems (AIPS's). Thus, the reference-information activity of

the System can be divided precisely into two areas: service by traditional methods, and in an automated mode.

The first includes:

an exchange among the VNO's (their servicing, on this basis, of their own national customers) of informational papers that have been created within the national oil and gas industries or that have come into the industry's information inventory from without; and

the joint development and publication of informational papers (basically, joint topical surveys) on urgent problems of the oil and gas industry.

Timely notice to customers about the presence of needed information that is in the inventories of the countries participating in the System, which is done by publishing and distributing papers of the reference-and-retrieval machinery, is assisting greatly in information exchange. This machinery includes a number of catalogs and lists in the preparation of each of which all NVO's are participating, some of them having been assigned the functions of the responsible executive agent.

A Catalog of Informational Publications of System Participating Countries, a Catalog of Topical Surveys, a List of Journals of Countries Not Members of CEMA, a Catalog of Books of Countries Not Members of CEMA, a Catalog of Papers of Symposia and Conferences, and so on, are now being published within the System's framework. Each customer of the System can order through his country's VNO and receive a copy or an original of informational papers, information about which has been placed in the enumerated documents of the reference-and-retrieval machinery.

This area of collaboration of the System's participating countries is marked by the fact that from 1978 through 1982, about 2,500 originals and 6,500 copies of original sources were exchanged. All these papers were used by the countries' scientists and specialists in scientific research, production and the adoption of managerial decisions.

The joint development of information is one of the important aspects of the System's activity, since the generalization of advanced achievements in the area of oil and gas science and technology in the form of topical surveys is its foundation. Since 1980 priority has been given here to problems that are included in long-term specific-purpose programs for collaboration by CEMA member countries. Since the System has been functioning, 26 distinct publications of this type have been published, including papers on the topics: "Improvement of Equipment and Technology for Preparing, Processing and Using Drilling Muds," "Action at the Bottom-Hole Zone of Oil and Gas Well Reservoirs," and "Raising the Reliability of Oil Pipeline Operations."

Now about the second areas of the information reference services. While in the first case, particularly in the preparation of joint surveys, the System's partners coordinate efforts when adopting a decision about issuing a paper prior to final preparation of it for publication, the information servicing in an automated regime is being performed for now by each VNO, which has an automated system separately on the base of its own data bank.

The System is now realizing a working design for a unified automated documentary-information retrieval system and a technical design for an automated data retrieval system--two component parts of Informneftegaz's AIPS.

The basic tasks that face the System's VNO's right now, which must be solved if the Informneftegaz's AIPS is to be introduced into operation on time, are: to provide for full informational compatibility of the countries' automated systems; to distribute among the VNO's reponsibilities for processing and introducing into the System the whole world's flow of information on the subject of the oil and gas industry; and to organize an exchange of information on magnetic tapes so that the countries may augment the unified AIPS's data bank by a simple "transfusion" of information and, in precisely the same way, "scoop out" the information that is needed for servicing their own national requirements.

After the Informneftegaz's AIPS is put into operation, the whole mass of information that is contained in national branch-of-industry systems in the form of abstracts, bibliographic descriptions of books, articles, patents, standards, reports and other papers, which number in the several hundreds of thousands of storage units, will be amalgamated into a single data bank. Each year the data bank will be augmented by several more tens of thousands of papers, through the joint efforts of the VNO's of the countries that participate in the System. Scientists and specialists of the CEMA member countries will obtain access to practically the whole world's flow of information on oil and gas industry topics.

Since the forming of the MOSNTI Informneftegaz, the partners in collaboration have done a large amount of joint scientific research and work on its development and functioning, on raising the level and effectiveness of the reference information services, and on improving national branch-of-industry systems of scientific and technical information. The practice of accomplishing, within the System's framework, bilateral contacts between specialists of the countries that have experimentally resolved specific tasks of creating the AIPS's has brought positive results.

In considering the high effectiveness of collaboration on the basis of agreements, the VNO's have, since 1982, begun to discuss and coordinate a number of contracts on the joint development of a polyglot thesaurus as a set of two-language thesauri.

The system faces tasks that are major and complex. The introduction into industrial operation of Informneftegaz's AIPS's was planned for 1985. It was planned to raise substantially the information services' responsiveness to customers through the wide use of modern technical means and through improvement of the System's organizational and functional structure. It is expected that a universal, unified system of means for microfilming, using standard microphoto carriers that operate in conjunction with computers, will have been formed by the end of 1990. By that same time, some countries participating in the System plan to create networks of videoterminal installations and intelligent terminals.

Fruitful collaboration of the VNO's of the countries that are participating in the System, businesslike and construction interrelationships between them, and, finally, a creative approach of the System's specialists toward the questions that are being examined will make it possible to expect, with full confidence, that these tasks will be resolved.

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SETTING OIL-WELL SERVICE LIFE NORMS NEEDS MORE STUDY

Moscow NEFTYANIK in Russian No 7, Jul 83 pp 10-11

[Article by A. Yanin of SibNIINP [Siberian Branch of the Scientific-Research Institute of the Oil Industry]: "The Service Life of the Wells--the Standards and Reality"]

[Text] The wells are the chief element of the basic production capital of the oil-recovery industry. Their special role is defined both by their operating function (direct connection with the processes of extracting the oil and of stimulating the deposits) and by their high share in the total cost of the fixed capital. In some parts of the country, from 50 to 77 percent of all fixed industrial-production capital goes to the wells, while the average figure for the industry's oil-recovery administrations is about 60 percent. Therefore, the degree of utilization of the well inventory exerts a governing influence over many technical and economic indicators of oil-recovery industry progress.

One of the important parameters that marks the wells' operation is their service life. The concept of service life at times incorporates different contents. Most often, in this case, the period of active operation of the wells during which they are employed to recover crude or artificially stimulate formations is meant. A knowledge of this indicator is necessary for planning the functional indicators of the oilfields' operation, and also for developing norms for amortizing the wells to full reclamation. Oil wells should transfer their value into the recovered product while they are actually being used in the production process. The oil-recovery industry as a whole has developed in an environment of increased active operating time for the wells and increased length of the amortization period.

In order to determine the period of active service, a census of the wells is made, with establishment of the dates of introduction and inactivation, the operating conditions, the cause of inactivation, and so on. On the basis of this large-scale survey of all or of a definite portion of the wells, the average indicators that mark the duration of actual use of the wells during development of the oilfields are computed. The results of the last well listing for the country's main oil-producing regions, which was conducted by VNIIOENG [All-Union Scientific-Research Institute for Organizing the Management and Economics of the Oil and Gas Industry],

was published more than 10 years ago, and the time has now come for a new study of the well inventory in order to determine whether the standards for well service life correspond to the actual service life.

The term "service life" can also be taken to mean the full time a well remains on the books of the oil-recovery enterprises, that is, the time between receipt of the well from the drilling organization and its abandonment and writeoff from the books because of unsuitability for further operation. The causes of the abandonment can be either of an operational nature (depletion of the oil reserves at a given sector of a deposit, complete flooding, and so on) or of a technical nature connected with the well itself breaking down.

Well abandonment, in its consequences and its influence on the technical and economic indicators differs from removing a well from the number of producing wellstock. The transfer of wells to the inactive category leads to a reduction in the amount of crude recovered or of water injected, but it is not linked with change in the value of the fixed capital and the amount of amortization deductions. Abandonment leads to a reduction in the total value of the fixed capital for the recovery of oil by the amount of the value of the wells written off and a cessation of credits for its amortization for workover. Amortization deductions for full restoration in both cases, as is known, are not changed, since they are made for 15 years, regardless of the well's actual service life.

The full service life (time carried on the books) of wells can also be determined by a survey of the wells that have been abandoned after operation. A defect of this method is high labor intensiveness, since the collection of information on the basis of accounting data involves great difficulties for many oil and gas recovery administrations: in the various oil-producing regions of the industry, from 300 to 2,700 wells of all types are abandoned annually. Moreover, results can be obtained in which the average service life of wells that have been inactivated is less than the amount by which the age of many operating wells increases. Thus, for example, in West Siberia, as of the start of 1982, the average service life of 39 wells abandoned after operation was 9 years. At the same time, of the wells that were put into operation in 1964-1965, that is, those that have served more than 15 years, more than 95 percent of them continue to be counted as fixed capital. Consequently, the method for determining the full service life should consider not only the indicators of the wells already abandoned but also of those wells that continue to be counted on the books of oil recovery.

Another method for determining service life is based upon the use of generalized indicators of the momentum of the well inventory over a long period of time. In particular, the following statistical interrelationship of service life, rate of growth and coefficient of the transfer of the fixed capital to inactive status can be applied

$$T=\frac{\ln(p+d)-\ln d}{p},$$

where T is the service life of the fixed capital in years, p is the rate of growth of the fixed capital, and d is the coefficient of transfer of fixed capital to inactive status.

By processing the statistical series that characterize the dynamics of the rate of growth of the well inventory and the coefficients of the transfer of wells to inactive status, an average period for their retention as fixed capital can be determined.

An analysis of actual data on the oil-producing regions indicates that a sharp jump in the dynamics of the transfer to inactive status is observed in many of them. While, on the average, 1-2 percent are transferred to inactive status annually, in some years the share of wells so transferred rises sharply. This is caused by the fact that, over a number of years, the oilfields of the regions accumulate large numbers of wells that are unsuitable for operation but are being counted on the oil-recovery books. Then the wells that have been accumulated are abandoned simultaneously, and the coefficient of transfer to inactive status is increased in this case severalfold over the average. Thus Kuybyshevneft' [Kuybyshev Oil Production Association] wrote off 8.7 percent of all the wells all at once in 1963, Azneft' [Azerbaijan Oil Production Association] 10.4 percent in 1968 and Dagneft' [Dagestan Oil Production Association] 13 percent in 1973. During 1978-1980 more than 1,200 wells at Tataria's fields were abandoned, that is, 2.9-fold more than during all the preceding years put together. Because of this sudden change in the inactivation coefficient, average indicators over a lengthy period of time must be used in computing service life.

Computations based upon indicators for 1961-1980 as a whole for production associations in which there are sufficiently representative data about the number of wells that have been abandoned after operation have given the following values for full computed service lives of wells: Tatneft' [Tataria Oil Production Association] 30 years, Bashneft' [Bashkiria Oil Production Association] 38 years, Permneft' [Perm Oil Production Association] 24 years, Orenburgneft' [Orenburg Oil Production Association] 28 years, Grozneft' [Groznyy Oil Production Association] 53 years, Azneft' 47 years, and Ukrneft' [Ukrainian Oil Production Association] 39 years.

For the country's oil-recovery industry as a whole, the time the wells remain on the books of the industry's enterprises is assessed at approximately 35 years. Consequently, the full service life of the wells exceeds the amortization period 2-fold to 3-fold on the average.

A comparison of the following indicators also shows the large amount of full time that wells remain on the oil-recovery books. At the start of 1961, wells of all types in the oil industry (under its modern organizational structure) numbered 41,800. During 1961-1980, 14,500 wells were abandoned. Consequently, at least 65 percent of the wells put into operation more than 20 years are still included in fixed capital.

Preliminary calculations for the small number of wells at West Siberian fields that have been abandoned after operation indicate that the full time period they remain on the recovery books is about 25 years here, that is, less

than in most other regions and in the industry as a whole. A knowledge of this period is necessary for long-range planning for the development of oil recovery and for the compilation of operating schemes and of designs for developing oilfields, since amortization deductions for workover, which is included in the operating expenses for oil and gas recovery, should be made during this service.

An analysis of the indicators of the momentum of the well inventory over a lengthy period of time also enables the conclusion to be drawn that, for the oil-recovery industry as a whole, the length of time that wells are counted as fixed capital is increasing. While 9,000 wells were abandoned in 1961-1970 in all the industry's associations, the number so eliminated in 1971-1980 was reduced to 5,500. Except for the influence of Azneft', in which operating conditions are marked by major irregularity, the number of abandoned wells remains unchanged and is equal to 4,100 for each 10 years. But, in view of the increase in the total well inventory during this period, the inactivation coefficient has been reduced considerably and the full service life has increased somewhat.

In most cases wells that have become worthless because of the conditions for developing the deposit or because of their technical status do not, in most cases, harm the process of extracting reserves and can for a certain period be counted as "awaiting abandonment." In postponing the writeoff of a group of wells for a certain time, the oil-recovery enterprises can, to a certain extent, arbitrarily increase their service life. These wells do not require expenditures for tending or repair but are a source of additional amortization deductions for the workover of wells that are operating. On the other hand, an accumulation of a large number of idle wells in the overall inventory degrades the indicators of effectiveness of use of the well inventory. Therefore, questions of justifying the retention of wells on the books as fixed capital for a rational period requires further specialized research.

It must be noted that the values of the retirement coefficients and the service lives of wells are determined not only by technical and operational factors but also by the overall prerequisites for developing the oil-recovery industry. Change in notions about profitability margins of well operation play an important role here. Because of conversion to the development of new, relatively less effective fields and deposits, the introduction into operation of these idle wells at old fields, from which recovery previously was unprofitable, can in some cases prove to be rational. Taking this into account, the desirability of abandoning only those wells that will be completely unsuitable in the long term for any kind of use in the process of developing the oilfields can be recognized as substantiated.

11409
CSO: 1822/300

CEMA COLLABORATION IN FORECASTING COAL RESERVES DESCRIBED

Moscow EKONOMICHESKOYE SOTRUDNICHESTVO STRAN-CHLENOV SEV in Russian No 6, 1983 pp 17-20

[Article by Gennadiy Luzin of the CEMA Secretariat, Nadezhda Zheleznova of VNIIzarubezhgeologiya [All-Union Scientific-Research for the Geology of Foreign Countries] (USSR) and Elemerne Somsed of the State Geological-Exploration Enterprise at Varpalat (MNK [Hungarian People's Republic]): "The Forecasting of Coal Fields"]

[Text] The problem of supporting the further economic development of most of the world's countries with fuel and raw materials has become universal in nature in the second half of the 20th Century. The total world extraction of all types of mineral raw materials in 1980 was valued, according to statistical data, at about $500 billion. In this case, the greatest part--88 percent--was for fuel (crude oil 60 percent, coal 16 percent, natural gas 12 percent).

It should be noted that more than 90 percent of the fuel-and-power resources of the world, including CEMA member countries, consists of oil, gas and mineral coal. In the last decade, interest in coal, the share of which in the structure of the fuel and power balance began to rise considerably (coal prices increased 4.4-fold during said period), increased sharply in many countries because of the great rise in prices for oil (17.7-fold in 1970-1980).

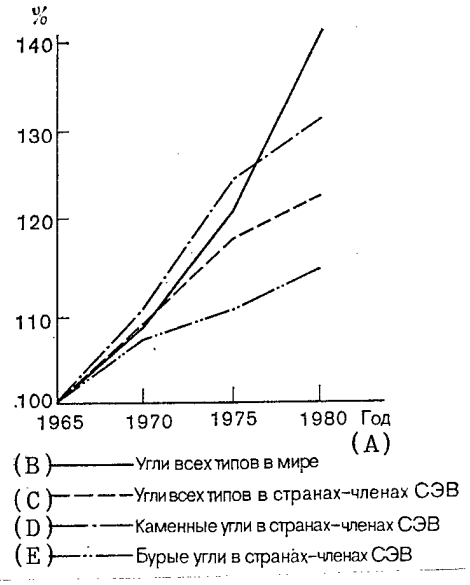
In forecasting the structure of the fuel and power balance for the foreseeable long term, an overwhelming number of nations plan to increase their share of the mining and use of coal. It should be noted, however, that a restructuring of the power-engineering balance requires substantial investment and material and labor expenditures. As was noted at the 11th World Mining Congress (Belgrade, 1982), development of the coal industry in a large portion of the nations had been held back prior to a certain time by an ample supply of inexpensive oil on the world market. These countries have now worked out specific measures for increasing the mining and use of coal.

World mining of coal in 1980 was 1.4-fold that of 1965, reaching 3.7 billion tons. In CEMA member nations 1.23-fold as much coal, or 1.4 billion tons (see figure), was mined. Recent forecasts have evaluated the potential possible mining of coal to be 7-9 billion tons by the year 2000. CEMA member countries,

Dynamics of Coal Mining in the World and in CEMA Member Countries.

Key:

A. Year.
B. Coal of all types, in the world.
C. Coal of all types, in CEMA member countries.
D. Coal, other than brown coal, in CEMA member countries.
E. Brown coal, in CEMA member countries.



having vast coal reserves at their disposal, are also calling in long-term plans for a buildup in coal mining. It must be emphasized that interest in coal as an industrial type of raw material has intensified recently.

The Standing CEMA Commission on Collaboration in the Field of Geology plays a major role in the study and evaluation of the CEMA member countries' coal potential. Various scientific-research and production organizations of the fraternal countries participate in solving these complicated problems. Concentration of their scientific and technical potential has enabled efforts to be directed toward carrying out the priority tasks that are associated with developing a raw-materials base for coal. For this purpose, a long-term forecast is being made, within the commission's framework, of the adequacy of the CEMA member countries' explored coal reserves and also of the prospects that their land is coal bearing, with a quantitative assessment of the coal resources, and, based upon that, of the prospects for developing the CEMA member countries' coal base. The results of the forecast will be used in coordinating five-year national-economic plans and in determining the long-range prospects for developing the coal industry, which require mandatory implementation of the forecasts once each 5 years. On the whole, here, this is the continuous process that is being executed within the system: forecasting, the forming of long-range programs, the development and coordination of long-term and five-year plans, and the realization of the programs and plans.

It can be noted that multilateral collaboration in coal geology within the CEMA framework is marked by high achievements in developing the CEMA member countries' raw materials base. It has helped greatly to raise the effectiveness of the geological search for coal, to expand and to go more deeply into the forecasting of new coal-bearing areas, to find and explore for new coal basins and fields, and to provide newly introduced underground and surface mines with reserves and resources.

Explored reserves of coal, including brown coal, with which the CEMA region is adequately supplied on the whole, given the modern level of mining (see the table), have risen considerably in CEMA member countries since the Commission has been active. They also have at their disposal large forecast resources, which are a reliable reserve for growth in explored coal reserves and for a further expansion of coal mining (see the figure).

Mining Industry Potential of CEMA Member Countries
(as of 1980)

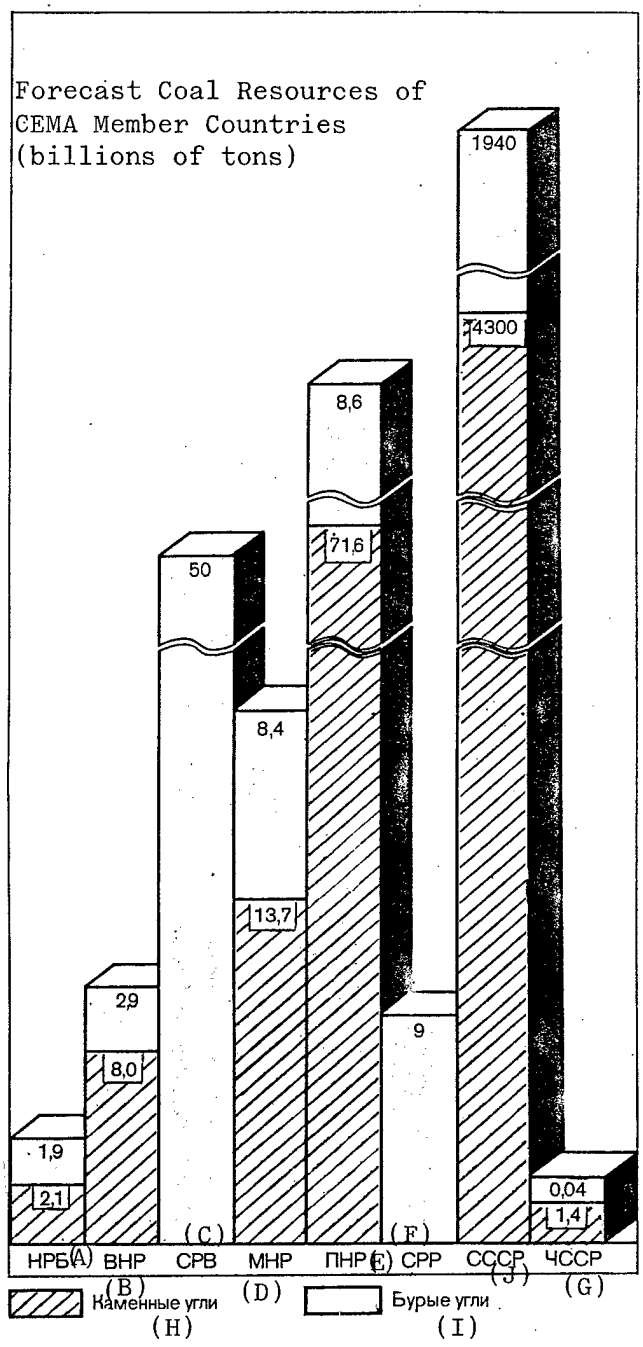
[Category]	Coals	BNR (A)	MNK (B)	SRV (C)	MNR (D)	PRL (E)	RSR (F)	USSR	CSSR (G)
Explored reserves of industrial categories, millions of tons	All types.....	4,311	4,228.3[1]	2,354.2	2,440.2	24,964	4,081	285,061.0	11,295[1]
	Other than brown	39	378.3[1]	2,310.0	1,450.2	21,654	875	174,045.5	1,725
	Brown.....	4,272	3,850.0[1]	44.2	990.0	3,310	3,206	111,015.5	5,870[1]
Mining, millions of tons	All types.....	29.2	25.9	6.9[2]	4.3	198.5	36.9	716.4	122.8
	Other than brown	0.2	3.0	6.9[2]	0.3	163.0	8.3	553.0	27.5
	Brown.....	29.0	22.0	-	4.0	35.6	28.6	163.4	95.3
Number of years for which the supply is adequate	All types.....	74	82	171	284	63	55	199	46
	Other than brown	98	63	167	...	66	53	157	31
	Brown.....	74	84	-	124	47	56	340	31

[1] Coal reserves of industrial categories, and prospective reserves.
[2] 1979.

A. People's Republic of Bulgaria.
B. Hungarian People's Republic.
C. Socialist Republic of Vietnam.
D. Mongolian People's Republic.
E. Polish People's Republic.
F. Socialist Republic of Romania.
G. Czechoslovak Socialist Republic.

Key:

A. People's Republic of Bulgaria.
B. Hungarian People's Republic.
C. Socialist Republic of Vietnam.
D. Mongolian People's Republic.
E. Polish People's Republic.
F. Socialist Republic of Romania.
G. Czechoslovak Socialist Republic.
H. Coal other than brown coal.
I. Brown coal.
J. USSR.



However, the distribution pattern for coal (including brown coal) resources on the lands of CEMA member countries is extremely uneven. The MNR [Mongolian People's Republic], PRL [Polish People's Republic], USSR and CSSR [Czechoslovak Socialist Republic] have at their disposal substantial reserves of coal, including brown coal; the BNR [Bulgarian People's Republic], MNK [Hungarian People's Republic], SRV [Socialist Republic of Vietnam] and RSR [Socialist Republic of Romania] have substantial reserves of brown coal and, to a lesser extent, of other coal, while the GDR has primarily substantial reserves of brown coal. This situation dictates the necessity to intensify and expand collaboration in forecasting the search for new fields and in evaluating them (see the figure).

For purposes of joint research in this area, the participating countries have developed a unified methodological base, on the basis of which recommendations have been made on the standard procedures for forecasting, prospecting for and exploring coal fields, including deep horizons. This research has enabled definition of the most important criteria for forecasting the presence of coal, as well as standardization of the methods for evaluating the coal's physical composition, the main properties of the rocks of the coal-bearing strata, the presence of gas, and so on. These are the bases for all further operations of CEMA member countries in regard to coal and fuel shale.

Based upon a unified methodology, CEMA member countries have drawn large-scale maps showing where coal has been found and the degree to which the coal reserves and resources have been studied, as well as maps that forecast the presence of coal, and they have plotted the geological reserves for 30 large basins of coal (including brown coal) and for more than 200 small basins, fields and coal-bearing areas. In 1983 a map showing the presence of coal in European CEMA members on the scale of 1:2,500,000 was made up and printed. An atlas of maps of coal basins and fields of European CEMA members and the SFRJ [Socialist Republic of Yugoslavia] is being readied for publication. The maps show areas with reserves that have been explored and given preliminary appraisals and promising areas with forecast resources, as well as areas for which the presence of coal has not been determined, areas that have coal whose exploration is not economically feasible, and areas known not to bear coal.

Research by CEMA member countries has enabled determination of the main consistencies in the distribution of coal basins and fields and clarification of the properties of the coal accumulations and of the distribution of coal of the various types by area and by depth. This will help to substantiate the planning of geological exploration for coal and to discover and evaluate a number of new basins, fields and areas within their borders for which the presence of coal is promising, such as the Lublin Coal Basin (PRL], the Dobruja Coal Basin (BNR), the brown-coal area of Gerech (MLK) and many others.

A quantitative forecast appraisal of coal resources on a unified methodological basis that the countries worked out in 1965 and improved in 1979 (the Coal Forecast-68 and the Coal Forecast-80) occupies a special place in the Commission's operating practice.

The full set of operations on the forecast evaluation of areas for which the presence of coal is promising stipulated a maximum estimated depth of reserves of coal as 1,800 meters, hard brown coal 600 meters, and soft brown coal (lignite) 300 meters, a minimum seam thickness for coal other than brown as 0.40-0.80 meter, for hard brown coal 0.7-1.0 meter, and for soft brown coal (lignite) 1.0-2.0 meters, with refinements in accordance with provisos for various basins that the countries have adopted.

When estimating forecast reserves, those that are suitable for exploration and development in the near term, as well as resources that are below horizons that are accessible to development and areas that are not favorable for development because of economic-geography considerations, are singled out. Reserves and resources have been subdivided by type of coal: steam coals, coking coals and special coals.

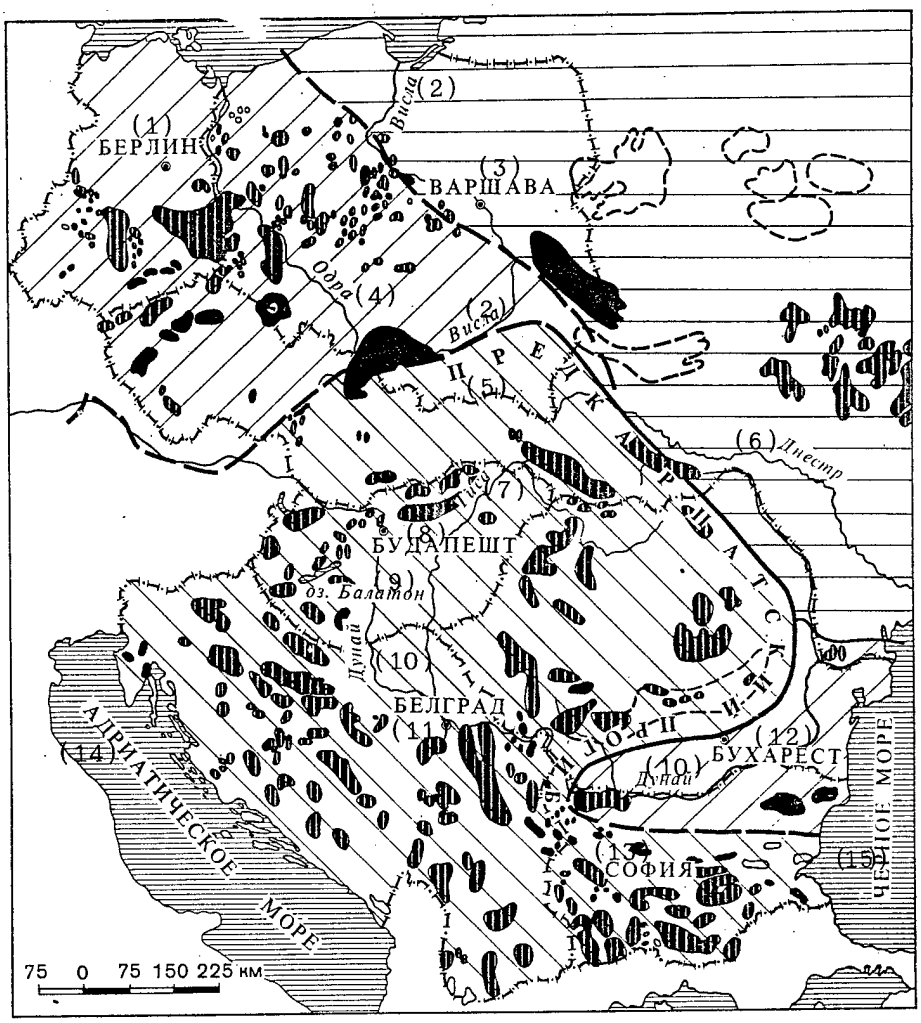
Coal Forecast-80, which was produced by the BNR, MLK, GDR, MNR, PRL, USSR and CSSR, pointed out that the forecast coal reserves for the participating countries were about 6.5 trillion tons. An analysis of their status indicates clearly that they are concentrated mainly in the USSR, PRL and MNR. A more tenuous situation exists in the CSSR, BNR, GDR and MNK. An appraisal of the possible prospects for growth in explored reserves has shown that in most cases the upper horizons of the leading coal basins will be practically depleted in the near future down to depths of 500-700 meters.

Location of Coal Basins and Fields of European CEMA Member Nations and Yugoslavia

Key:

A. Outlines of coal basins, coal-bearing areas and coal fields.
B. Coals including anthracite) other than brown coal.
C. Brown coal.
D. Borders of areas of folding of different ages.

1. Berlin.
2. Vistula.
3. Warsaw.
4. Oder.
5. Ciscarpathian trough.
6. Dniester.
7. Tisza.
8. Budapest.
9. Lake Balaton.
10. Danube.
11. Belgrade.
12. Bucharest.
13. Sofia.
14. Adriatic Sea.
15. Black Sea.



Later prospects for mining are linked with the exploitation of greater depths, where, as an analysis of geological data indicates, mine-geology conditions are much worse: temperatures are higher and mine pressure is more intense. When taking coal by surface mining, the stripping coefficient rises, and the geological-engineering conditions for developing the fields become more complicated.

Because of this, CEMA member countries are aiming their exploration for steam coal and brown coal at finding districts with mine-geology conditions more favorable for development, and their exploration for coal other than brown coal at investigating deep horizons with a view to providing for an increase in coking-coal reserves.

The commission pays major attention to the study of coal quality, which determines the main directions of the coal's use in CEMA member-nation economies. In implementation of programs for collaboration, the participating countries have constructed on a unified methodological base 196 maps of coal quality for the main coal and brown-coal basins and have completed consolidated maps of the quality of brown coal and of other coal for CEMA member countries and for the SFRJ on a scale of 1:2,500,000.

These maps depict the distribution of zones of metamorphism and grade composition, singling out coking coals, power-generation coals and special coals. The petrographic composition and the main coal-quality indicators are pointed out. Coals with different specific heats of combustion, with high content of sulfur or of intermediate constituents, are singled out, and the ash and moisture content indicators of the coals are depicted. The data available enable CEMA member countries to evaluate the resource potential by type and grade of coal and to consider this when projecting their geological exploration for coal, evaluating the possible areas for using coal and forecasting the location of their mining industry.

The Commission recently has begun to pay great attention to determining the potential of nontraditional types of coals, especially the pulverized varieties, saline coals and others, as well as of coal resources that are concentrated in thin seams or are bedded under complicated mine-geology conditions, with a view to drawing them into the economic turnover. In so doing, attention to evaluating nontraditional coal resources for possible processing thereof by geotechnological methods is being intensified. This is of especially great importance for well-studied areas with developed industry where coal reserves and resources have been exhausted to a substantial degree.

It is desirable that CEMA member countries collaborate further in forecasting coal fields in the following areas:

the use of coal-quality charts that have have been compiled, when determining the directions for prospecting and exploration, with a view to discovering new fields of coking coals, high-quality steam coals, and chemical-industry groups of brown coal and of other coals with a standardized content of sulfur, ash and other components, and to discovering fields and promising areas that are suitable for stripping operations;

evaluation of possible variants of the use of coal in the national economy when estimating forecast resources of coal and of fuel shale for 1990;

intensification of geological exploration at deep horizons with mine-geology conditions that are difficult to master;

research of the possibilities of making more rational use of coal reserves, to take into account their chemical-industry features, and discovering possible new areas for using them;

improvement of standard-practices procedures for predicting coal fields and for making a geological and industrial evaluation of them, with a view to increasing the effectiveness of geological exploration; and

the development and improvement of geophysical methods applied during forecasting also when making industrial appraisals at early stages in the study of coal fields.

CEMA member countries, being guided by the Integrated Program and the DTsPS [Long-Term Specific-Purpose Program of Collaboration] in the Field of Energy, Fuel and Raw Materials, are jointly solving long-term tasks of providing industry with explored coal reserves, are examining specific proposals for satisfying more completely the rising requirements for coking and steam coals, and are solving problems associated with the forecasting and quantitative assessment of coal resources.

11409
CSO: 1822/293

ALTERNATE FUELS

SELECTED SYNOPSES OF ARTICLES IN TORFYANAYA PROMYSHLENNOST' , JUNE 1983

Moscow TORFYANAYA PROMYSHLENNOST' in Russian No 6, Jun 83 p 32

UDC 622.331:658.387

DEVELOPMENT AND IMPROVEMENT OF BRIGADE FORMS FOR ORGANIZING LABOR ARE IMPORTANT FACTORS IN SUCCESSFUL EXECUTION OF 11TH FIVE-YEAR PLAN TASKS

[Synopsis of article by Ch. A. Kruglinskiy in TORFYANAYA PROMYSHLENNOST' No 6, 1983 pp 2-5]

[Text] The results of operation of the Belorussian SSR fuel industry during 1982 and the tasks for 1983 are given. The collectives that won the socialist competition are noted. Information about the brigade form for organizing the work at the republic's peat enterprises is related.

UDC 622.331:622.271.9:631.35/55

WINNING ROTARY-TILLED PEAT BY AD HOC CYCLE SCHEDULES

[Synopsis of article by V. I. Smirnov in TORFYANAYA PROMYSHLENNOST', No 6, 1983 pp 13-16]

[Text] The necessity for developing ad hoc schedules of cycles that take into account the forecast category of drying days is substantiated. A formula and schedules for ad hoc planning of layer thickness as a function of expected weather conditions and the actual beneficial content of rotary-tilled crumb at the start of the season is proposed. The results of introducing ad hoc cycle schedules in two sections in 1982 are cited. 3 illustrations, 4 references.

UDC 622.331.001.5

CURRENT ANALYSIS OF USE OF WEATHER FOR WINNING ROTARY-TILLED PEAT AT ENTERPRISES

[Synopsis by A. V. Lazarev, Ye. S. Dem'yanov, V. Ye. Kulagin et al in TORFYANAYA PROMYSHLENNOST' No 6, 1983 pp 16-18]

[Text] The results of current analysis of the use of weather for winning rotary-tilled peat during the 1982 season at the Kalinin, Shatura and Yaroslavl production enterprises are cited.

The basic causes for incomplete use of meteorological conditions are examined and suggestions are given for insuring maximum possible use of the weather. 2 tables, 2 references.

UDC [622.331:631.516].001.5/6

EFFECT OF TIME DELAY BETWEEN PRODUCTION OPERATIONS IN GATHERING PEAT

[Synopsis of article by A. N. Volkov in TORFYANAYA PROMYSHLENNOST', No 6, 1983 pp 19-20]

[Text] An analysis of an evaluation of the effect of the time delay between gathering and milling during the seasonal gathering of rotary-tilled peat is given by graphic modeling of the basic operations of the technological process. Ways to eliminate above-plan delays are recommended. 1 illustration.

UDC 622.331:622.271.9

TEMPORARY VARIABILITY OF OPERATING PARAMETERS OF GATHERING MACHINES DURING PEAT-WINNING PERIOD

[Synopsis of article by L. M. Malkov and N. V. Dialektov in TORFYANAYA PROMYSHLENNOST' No 6, 1983 pp 20-22]

[Text] The results of processing controllers' log data of Orsha Peat Enterprise No 1 are cited. The interdependence of change of operating parameters and the reliability of the gathering machines during the winning period is established. The statistical characteristics of the continuance of operation of gathering machines per day for the days of the winning period are constructed. 1 table, 3 illustrations.

UDC 622.331.002.5.004

RESEARCH ON DEFORMATIONS OF REWORKED PEAT DEPOSIT UNDER BEARING SURFACES OF TRACKED MACHINERY

[Synopsis of article by A. K. Kochedykov, Yu. S. Komarov and V. V. Pokamestov in TORFYANAYA PROMYSHLENNOST' No 6, 1983 pp 22-25]

[Text] The results of research on the deformability of a reworked layer of a peat deposit of limited thickness under tracked propulsive elements are presented. Consistencies of change in the deformability of the peat deposit over the year are indicated. 2 illustrations, 4 references.

UDC 553.97:53.093

PRODUCTION TESTS OF EQUIPMENT FOR WITHDRAWING PEAT SAMPLES FROM HEAPS

[Synopsis of article by V. M. Ivanov and Ye. Ye. Petrovskiy in TORFYANAYA PROMYSHLENNOST' No 6, 1983 pp 25-27]

[Text] The results of production tests of equipment for withdrawing samples of rotary-tilled peat from heaps are set forth. It is shown that the equipment provides for obtaining precise information about the moisture and ash content of the peat that has been removed. The possibility of using OPT [peat-sample withdrawing] equipment in the system for the responsive control of winning rotary-tilled peat is pointed out. 3 tables, 2 references.

UDC 622.331.002.22

PRODUCTION TESTS OF INSTALLATION FOR PNEUMATIC BREAKDOWN OF ROTARY-TILLED PEAT

[Synopsis of article by V. A. Kuznetsov, M. M. Palekha, V. S. Gutorov et al in TORFYANAYA PROMYSHLENNOST' No 6, 1983 pp 27-28]

[Text] The necessity for using pneumatic breakdown in drier hoppers and in the loading hoses of presses at peat-briquetting plant is substantiated. The principle of operation of an experimental model of an installation for the pneumatic breakdown of rotary-tilled peat (UPT) is described and the results of production tests are presented. 1 illustration.

UDC 622.331:553.97:491.4

COMPOSITION OF DISCHARGED PEAT-MARSH WATER

[Synopsis of article by I. F. Largin, Ye. T. Bazin, V. I. Kosov et al, in TORFYANAYA PROMYSHLENNOST' No 6, 1983 pp 28-31]

[Text] The results of study of the composition of discharged peat-marsh water when the drainage network is being constructed and the marshes are being prepared are cited in the example of the draining of a high-moor type deposit. Qualitatively new consistencies in the change of solid discharge as a function of the initial depth of the drainage canals was established. 1 illustration, 2 tables, 4 references.

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CEMA COLLABORATION IN NUCLEAR-WASTE DISPOSAL DESCRIBED

Moscow EKONOMICHESKOYE SOTRUDNICHESTVO STRAN-CHLENOV SEV in Russian No 6, 1983 pp 46-49

[Article by Aleksandr Panasenkov, manager of a section of the CEMA Secretariat, and Vsevolod Tolpygo, of the CEMA Secretariat: "An Important Task in Developing Nuclear Power"]

[Text] Radioactive waste is formed at practically all operating stages of nuclear power generation. It is accumulated in liquid, solid and gaseous form and it has varying levels of activity. The main bulk of it is obtained at the starting stage of the cycle--the mining, processing and enrichment of uranium and the manufacture of fuel elements. Waste that is smaller in volume but more active is accumulated at the final stage--reactor operation, reprocessing of the irradiated fuel, and removal of the nuclear installation from operation. A description of radioactive waste at various stages of the fuel cycle is shown in the table.

A considerable increase in the amount of radionuclides and their compounds that are produced knowingly or are obtained as byproducts accompany the dynamic development of nuclear equipment and power engineering. They are all a potential source of danger for man and the environment and should be reprocessed for safety and economy.

So much radioactive waste is now being produced that it must not be released directly into the environment. With the development of nuclear power, the amount thereof will grow steadily. This is occasioned by the fact that 1 MW (electric) per year is produced, on the average, by 1 kg of fission products, and 1 kg of it, even after a 5-6 month interval, contains several thousand curies of radioactivity.

In order to show what a danger this presents, let us note that in 1982 the total capacity of the world's AES's reached almost 185,000 MW, and the amount of radioactive substances approached 185 tons, which corresponds to $7 \cdot 10^{10}$ curies of total radioactivity. Spreading these substances evenly over the earth's surface would pollute the environment far beyond the permissible level. Under these circumstances, the problem of rendering radioactive waste harmless becomes one of the basic factors in further development of the industry and the use of nuclear power in various areas of the national economy.

Source of the waste	Type of radioactivity of the waste	Form of the waste	Representative isotopes
The mining and processing of uranium ores	Natural activity	Solid	Uranium-238 Radium-226 Thorium-230
		Liquid	Radium-226
		Gaseous	Radon-222
Plants that manufacture uranium fuel	Natural activity	Solid Liquid Gaseous	 Uranium-235 Uranium-238
Reactor operation	Activity of products of activation and of fission products	Solid	Cobalt-58 Cobalt-60 Iron-59 Manganese-59 Cerium-144
		Liquid	Cesium-137 Tritium Strontium-90
		Gaseous	Argon-41 Sulfur-33 Iodine--131 Xenon-133
Plants that reprocess fuel	Activity of fission products and of transuranium elements	Solid	Americium-241 Strontium-90
		Liquid	Cesium-137 Plutonium Cerium-144 Tritium Zirconium-99
		Gaseous	Iodine-131 Iodine-129 Krypton-85 Tritium
Use of isotopes in industry	Activity of products of activation and transuranium elements	Solid	Cobalt-60 Strontium-90 Cesium-137 Plutonium
		Liquid	Tritium Carbon-14 Phosphorus-32 Cerium-144
		Gaseous	Iodine-131

Radioactive Wastes from AES's

A definite amount of gaseous, liquid and solid radioactive substance inevitably is given off during normal operation of an AES. This, as a rule, is waste of a low or intermediate level. Adequately reliable methods for processing it have been created today. They enable radionuclides to be concentrated into a small volume of concentrates, which can be subjected to safe burial. Purified water whose radionuclide content has been brought down to permissible levels can be used either at the same enterprises or discharged into open bodies of water.

Nevertheless, despite the existence of proven technology for rendering it harmless, some capitalist countries discharge this waste into a water medium without treatment. While, given the present level of development of nuclear power, this will not lead to serious consequences, by the year 2000, when the capacity of AES's has grown manifold, the danger is difficult to overestimate.

CEMA member countries proceed on the principle that AES waste can be discharged only after the radioactive substances that it contains have been removed and they have been brought below the maximum permissible levels of concentration. Achieving such a concentration by means of dilution is not permitted, since the amount of radioactivity in this case is not reduced.

By Joint Efforts

Research in the areas of processing and burying radioactive waste occupies one of the important places in CEMA member-country collaboration. It began to be developed most successfully after the establishment of the Standing CEMA Commission on the Use of Nuclear Power for Peaceful Purposes in 1960.[1] Scientific and technical conferences on these questions were held in 1964 and 1967. They enabled more rational approaches to solving the problems to be found, approaches that consider the waste's physical and chemical composition, radioactivity and radiotoxicity, that is, those factors that govern the prerequisites for processing and hauling and the degree to which they must be isolated from the environment. Since then, such conferences and symposia have been held regularly.

In 1971 the Scientific and Technical Council on the Processing and Burial of Radioactive Waste and the Radioactive Decontamination of Equipment was created within the Commission's framework. Taking part in its work are Bulgaria, Hungary, the GDR, the Republic of Cuba, Poland, Romania, the USSR and Czechoslovakia. The Council's basic job is to assist multilateral-collaboration organizations in analyzing the status and trends in progress in research in this area, determining the basic areas of work, studying the economic effectiveness of introducing the results of joint research into practice, and organizing the exchange of experience and information.

Since that time, collaboration has been performed on the basis of the program, "Research in the Area of Rendering Liquid, Solid and Gaseous Radioactive Waste

[1] In 1981 it was converted into the Standing CEMA Commission on Collaboration in the Field of the Use of Nuclear Power for Peaceful Purposes.

Harmless and the Radioactive Decontamination of Contaminated Surfaces." Its purpose is to create and experimentally verify on an enlarged scale various methods for processing waste in order to obtain representative data suitable for comparing various schemes and apparatus, for choosing optimal schemes and for preparing standard-practices documents.

Research conducted under the collaboration program has made it possible, in a comparatively short time, to recommend industrial processes that use ion exchange, evaporation, reverse osmosis and electrodialysis for processing liquid radioactive waste. For purposes of solidifying liquid radioactive waste, cementing and bituminizing methods are called for.

Each country is using these results, taking its own specific circumstances into account. Thus, in Bulgaria, Poland, the USSR and Czechoslovakia, bituminizing is being used to solidify AES waste with low and intermediate levels of radioactiveness. It has a number of advantages over other ways. As experience has indicated, practically all types of liquid waste can be solidified by being subjected to this method. Installations for bituminizing have been established on the basis of cooperation and have successfully passed tests of various types. As a result, such installations, with rotary film bituminizers of different productivities, twin casings, and so on, are now being introduced or their introduction is planned at AES's that are being built. A study of the safety of storing and burying the bituminous blocks also has been conducted.

A number of standard-practices documents have also been prepared by combined efforts. These include: a List of Unified Analytical, Technical and Economic Indicators for Evaluating the Results of the Work of Operating Installations for Processing Liquid Wastes That Have Low and Intermediate Levels of Radioactivity; Criteria for Choosing Methods for Rendering Radioactive Waste Harmless as Functions of the Properties of the Wastes and of the Natural Conditions for Burial; and standard-practices procedures for choosing optimal modes for bituminizing radioactive wastes and safe burial prerequisites for wastes that have been solidified, depending upon their properties, specific activity and so on.

An important place in this collaboration is assigned to methods for burying radioactive wastes in geological formations. The job consists in creating storage sites in surface horizons, and also in deep water-saturated formations and saline formations. Extensive theoretical, laboratory, field and industrial-test research connected with the technology of burying radioactive waste has been performed in these three areas. Data has been obtained about the sorption, migration and diffusion of radioactive elements in soils and water-bearing horizons, and the prerequisites for the compatibility of radioactive wastes with a formation's rocks and with stratal waters have been studied. The technology for preparing waste for burial in deep absorptive water-bearing horizons and chemical methods for restoring well injectivity has been created. The results thereof play an important role in forecasting the spreading of radioisotopes in water-bearing horizons of different mineralogical composition and in organizing a system for monitoring the processes of underground burial of radioactive waste.

The study and assessment of temperature fields during the burial of radioactive waste in geological formations have great theoretical importance. Schematics of underground storages, taking into account the region's hydrogeological conditions, the composition and volume of the waste, and rational schemes, designs and methods for analyzing surface and underground storage structures, have been developed.

Research has also been conducted on substantiation of industrial-test burial in salt mines, and experimental design work has been performed on the forming of a unified system of transport containers for wastes of low and intermediate levels of radioactivity. This has enabled the technological bases for burial in geological formations to be established.

As the scale of use of nuclear power for peaceful purposes and the scale of generation of electricity at AES's increase, special attention is being paid to the technology for handling gaseous wastes that are the products of various operations of the nuclear fuel cycle. Proper handling and processing of them are important tasks, which are invoked to insure protection for man and the environment.

As is known, as a result of reactor operation, fluxes are formed that contain radioisotopes of the noble gases argon-41, krypton-85 and xenon-133 and radioactive iodine-129 and -131, tritium and oxides of carbon-14. The output of gaseous radionuclides during the cutting and disolution of the nuclear fuel at fuel-reprocessing plants is especially important.

The collaboration of CEMA member nations in this area is intended to provide for reliable methods and means for capturing and concentrating long-lived isotopes for their later separation and burial.

A set of studies is now being conducted to create an automated gas-scrubbing system that will be capable of performing these operations without man's participation. This will insure the safety of personnel and reliability and rapidity of control.

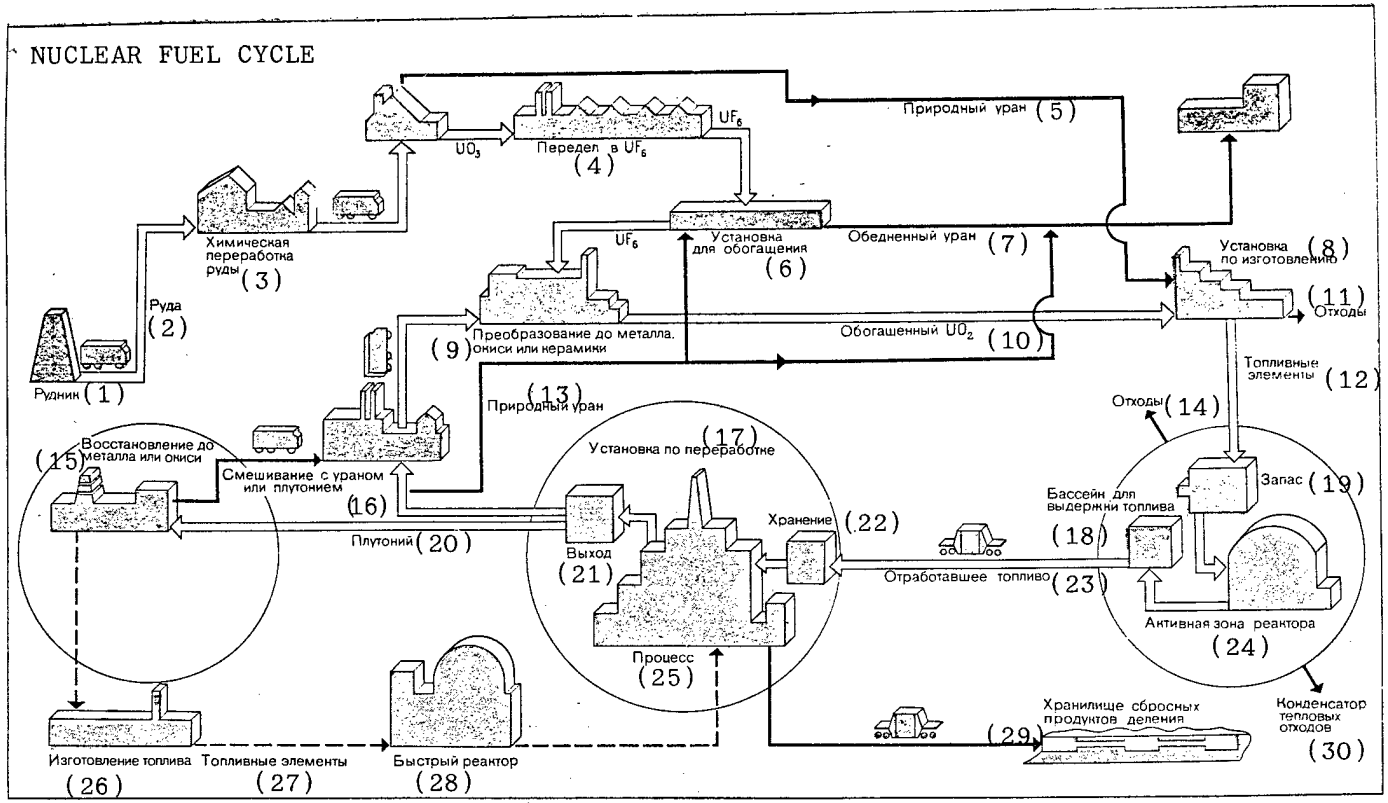
Processing Highly Radioactive Waste and Rendering It Harmless

This question is one of the most important today in nuclear power. The pace of the latter's developments depends greatly upon its being solved.

Insuring the safety of burial of waste of all degrees of radioactivity that is formed as a result of AES reactor operation and the later reprocessing of irradiated fuel at radiochemical plants is acquiring special importance today. From them come not only technical, economic and managerial problems but also political problems.

Western countries that have radiochemical plants accept from other countries spent fuel for regeneration with the proviso that the latter will take burial of it upon themselves. The Soviet Union takes a completely different position. It does not impose such requirements when accepting for processing the spent fuel of AES's that have been constructed in accordance with Soviet

Key:



1. Mine.
2. Ore.
3. Chemical conversion of the ore.
4. Conversion into UF_6.
5. Natural uranium.
6. Concentrating facility.
7. Depleted uranium.
8. Manufacturing facility.
9. Transformation into a metal oxide or ceramic.
10. Enriched UO_2.
11. Waste.
12. Fuel elements.
13. Natural uranium.
14. Waste.
15. Conversion to a metal or oxide.
16. Mixing with uranium or plutonium.
17. Reprocessing installation.
18. Holding pool.
19. Reserve
20. Plutonium.
21. Output.
22. Storage.
23. Spent fuel.
24. The reactor's active zone.
25. Process.
26. Manufacture of fuel.
27. Fuel elements.
28. Breeder reactor.
29. Storage for discharged fission products.
30. Hot-waste condenser.

designs. As indicated by many years of investigation by interested CEMA member nations, the problem of burying highly radioactive waste can be decided optimally on the basis of broad and close mutual actions. What are we talking about?

It is known that up to the present, the countries that have such plants (France, England, the FRG, Belgium and the U. S.) are storing the waste in liquid or solidifed forms in special tanks, which provide reliable insulation from the biosphere for an adequately long time.

However, because of the increase in the amount of highly radioactive waste, which is caused by nuclear-power development and by the rise in the level of radioactivity, as well as by the introduction of breeder reactors into operation, the problem of long-term storage and disposal of waste is becoming increasingly complicated. Therefore, a number of tasks aimed at solidifying highly radioactive liquid waste must be resolved now. This will lead to a reduction in its volume and will greatly increase the reliability of both temporary and long-term storage and to the development of methods for long-term storage and final disposition (burial) of this waste.

CEMA member countries are taking mutual actions today that take these tasks into account. Moving up to first priority is the problem of burial as a function of the waste's radioactivity. Such an approach will enable methods for separate processing and disposal to be created. This concerns first of all actinides which, because of the long half-lives of certain elements, retain radioactivity for hundreds of thousands and even millions of years. The solution of this problem will enable a considerable reduction in the time that storage must be monitored after the radioactive components are separated, with a view to insuring that the radioactivity is reduced to a safe level.

Also of no little significance is the solution of questions connected with separating from the waste those radionuclides that are valuable for science and technology, such as strontium-90 and cesium-137, and radium and palladium, which cannot be obtained in adequate amounts by other methods.

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NUCLEAR POWER ENGINEERING INSTITUTE TO BE CREATED AT OBNINSK

Moscow ENERGETIK in Russian No 6, Jun 83 p 37

[Article by G. A. Sereda, director of the Obninsk Branch of MIFI [Moscow Engineering-Physics Institute]: "About a New Institute for Training Engineers for Nuclear Power Engineering"]

[Text] Specialists in nuclear power engineering should have, along with a good general engineering training, primarily in physics and mathematics, a deep knowledge of the special disciplines and should be able to visualize accurately and to control responsively the whole complicated complex of processes that occur within nuclear power-engineering systems.

In order to support the ever-growing requirement for highly qualified engineers for nuclear power engineering for the Soviet Union and the countries of socialist collaboration, a new vuz--the Institute of Nuclear Power-Engineering (IATE) is being established in the city of Obninsk--based upon a branch of the Moscow Engineering-Physics Institute.

The choice of the location is not accidental. Obninsk is close to the principal nuclear power stations that are in operation or under construction in the USSR, as well as to Moscow, thus enabling close ties to be maintained with the AES's and with leading vuzes (MIFI, MEI [Moscow Power-Engineering Institute], MVTU [Moscow Higher Technical School imeni N. E. Bauman], MGU [Moscow State University imeni M. V. Lomonosov] and others) and scientific-research institutes. Obninsk itself has now grown into a scientific center, which has large scientific-research institutes that are close in fields of interest to the departments of the future Institute of Nuclear Power Engineering.

This will enable it to be supplied with highly qualified instructor personnel and with places for the students to gain practical experience and to do scientific research.

The main educational building, with an assembly hall and a library, a building for the departments, and, in the housing area--well-appointed 9-story dormitories for students and graduate students, that were designed for residence of the whole student body--will be sited in the educational area. Two- and three-room apartments are called for in unitized-type dormitories, in each unit of which are a showerroom, a study room, a kitchen and a number of other

conveniences. The housing zone will have all the necessary service-type institutions--stores, a domestic-services combine, buffets, dining halls and so on. The athletic area will include a stadium and athletic halls. It is planned to build housing for the institute's professors and instructor staff and workers on Obninsk tracts that are adjacent to IATE's land.

Prior to opening of the new institute, the reception of students for the first course of the Obninsk Branch of MIFI will be held annually in June, directly at the Moscow Engineering-Physics Institute (Moscow, Kashirskoye Shosse, d. 1).

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NEW MEANS FOR LOCATING FAULTS IN RURAL POWER LINES DESCRIBED

Moscow ENERGETIK in Russian No 6, Jun 83 pp 24-26

[Article by Candidate of Engineering Sciences A. P. Kuznetsov of Soyuztekhenergo [All-Union Production Association for the Adjustment and Improvement of Equipment for and Operation of Electric-Power Plants and Networks]: "The Use of New Equipment for Locating Faults in Rural Power Lines"]

[Text] Devices for locating faulty places (OMP) in electrical distribution grids that are founded on the measurement of the parameters of disturbed operation are used widely in the Soviet Union's power system. Positive experience has now been gained in the use of these devices, which enable the technical and economic indicators of power-system operation to be improved, emergency shortfalls in the distribution of electricity to customers to be reduced, and labor costs for detecting sites of faults to be cut.

In recent years the Soyuztekhenergo Production Association, jointly with Sel'energoproyekt [All-Union State Design, Surveying and Scientific-Research Institute for Rural Power Systems], MIISP [Moscow Institute for Agricultural Production Engineers imeni V. P. Goryachkin], manufacturing plants and advanced power systems, have developed and prepared for industrial output new and effective means for OMP of power-distribution grids.

In 1982 Riga's experimental plant, Energoavtomatika, began the serial output of current-recording indicators of the FPT type and voltage-recording indicators of the FPN type, which provide for automatic reading of the current and voltage components of the negative sequence where there are k. z.'s [short circuits] in an electric-power grid.

The FPT indicator is intended for determining distances to the sites of two-phase short circuits in distribution grids.

In determining distances in 6-10 kV grids, the indicator is placed (figure 1a) on the input to a 10 (or 6) kV station's busbars. The device includes an input unit (BV), an analog-digital converter (ATsP), an indicator unit (BI) and, at substations with variable control current, a power supply unit (BP). The main elements of the input unit are a negative-sequence current filter (FTOP) and a compensating element (EK).

The negative-sequence current filter transforms the value of the negative-sequence current components into voltage, which then is adjusted by the EK to take into account the value of the connected-current load during pre-emergency operation, and it is stored in the ATsP unit.

In the case of a fault that can be suppressed without intervention at the place where it occurred, which is accompanied by disengagement of one of the line's circuit breakers and, accordingly, the appearance of a signal from the alarm system (AS) device, the signal in the ATsP unit is converted into a pulse signal that is proportionate to the number of impulses. In the case of a fault that can be suppressed without intervention at the place where it occurred and APV [automatic reclosing] is successful, the potential for dumping the information is provided for. In this case, the device is automatically prepared for receiving information.

Where short circuits can be cleared only by action taken at the point of the fault, the BI unit counts impulses and puts the results into long-term storage with output thereof to the digital indicator bulbs. The indicator's lines are graduated directly in units of the measured value, in amperes in this case. The FPT indicator is set on the input to the substation busbars, enabling determination of the sites of two-phase short circuits at any of the substation's lines fed by the transformer. In this case, the load of the unfaulty lines affects precision in determining the distance to the fault site. Where there is a great load, the measurement error for distance can be great (up to 20-30 percent or more). The use of a compensator element in the indicator enables a reduction of the indication error, and the distance to the site of the fault is determined with fairly high precision.

For more effective use of the indicators, employment of the method proposed by the Belorussian Power System is recommended. Under this method, the currents for two-phase short circuits for various points of each of the outputs from the substation of the line are computed ahead of time. In accordance with the results of the computation, the lines that join the points with different values for the negative-sequence short-circuit current are plotted on a 10 (or 6) kV power-grid diagram (figure 1b). It is recommended that these lines be laid out directly on the indications of the FPT indicator, as shown in the figure.

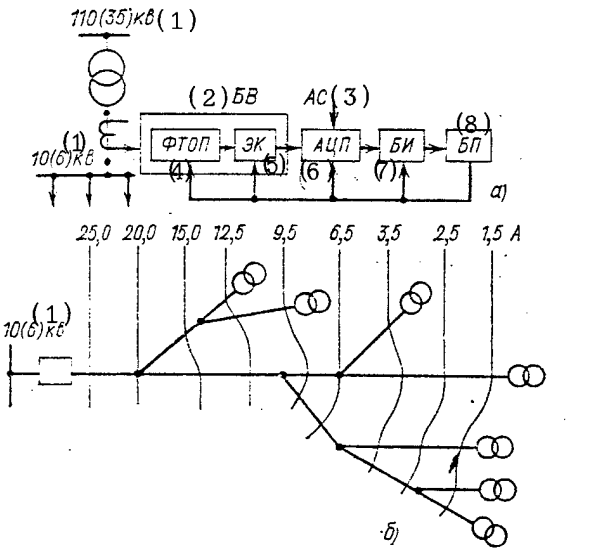
The plant produces the FPT indicator in accordance with the type of the current of the feed source, in two modifications: for feed from an AC source with voltages of 100, 127 or 220 V, and for feed from a DC source of 110 or 220 V.

The negative-sequence current is recorded in bands: from 1.0 to 50 A or from 2.0 to 100 A at a nominal transformer current of 5 A; and from 0.2 to 10 A or from 0.4 to 20 A where the nominal transformer current is 1 A.

The FPT indicator can be used effectively not only in 6-10 kV grids but also in those with 35 kV or higher voltages.

For remote locating of sites of faults, FPN indicators which register the voltage components of the negative sequences can also be used effectively

Figure 1.



a. Diagram for Connecting FPT-Type Recording Indicator to the Input of a 10 (or 6) kV Substation;

Key:

1. kV.
2. BV [input unit].
3. AS [alarm system].
4. FTOP [negative-sequence current filter].
5. EK [compensating element].
6. ATsP [analog-digital converter].
7. BI [indicator unit].
8. BP [power-supply unit].

б. Scheme for a 10 (or 6) kV Line with Equicurrent Lines.

Key:

1. 10 (or 6) kV.

in these networks. The FPN indicator has been built according to the same functional diagram as the FPT indicator, but the BV unit contains a negative-sequence voltage filter, and the compensating element is absent in this case. The negative-sequence voltage band recorded by the indicator is 2.0-100 V.

In order to speed up the search for the fault in 35-100 kV distribution grids, the simplest indicators can be used, in combination with the recording indicators, for supports and insulator strings with damaged insulation.

It is planned to produce for the power system, beginning in 1984, UPG-1 type indicators for faulty insulation strings, which were developed by the PO Soyuztekhenergo, jointly with Riga's experimental plant, Energoavtomatika.

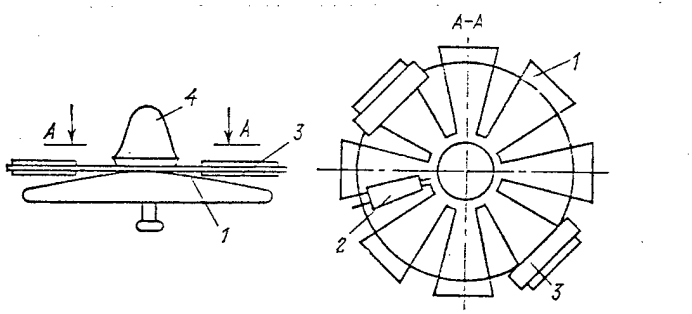
The indicator (figure 2) contains a reacting element 1, which is made of steel wire, a coupling 2, which is intended for fastening the ends of the reacting element, and two signal flags 3.

The indicator is installed on the cap of an upper insulator of an insulator string, as shown in figure 2. The signal flag indicators enable visual determination that an indicator is present on an insulator string at distances of up to 50-70 meters.

If there is an arc-over of the insulator strings, the reacting element burns up partially and the indicator drops off the string.

The coupling enables the indicator to be installed without dismantling the insulator string. The reacting element is made of a zinc-coated wire, which provides for a long service life for the indicator.

Figure 2. UPG-1 Type Indicator of Insulator String With Faulty Insulation.



With the use of 1.5-mm diameter wire for the reacting element, the indicator reliably drops off when the arc-over current is 1 kA or higher if the current lasts 0.1 second or more.

The indicator accurately points out a support or insulator string with faulty insulation on networks of 110 kV or higher.

On 35-kV grids, the indicator permits the place of arc-over of line insulation to be determined where there are double-ground faults. The simplicity of the design enables power-system forces to produce the

Since 1982 the Mytishchi Electrical-Machinery Plant has been serially producing portable Volna-type instruments for searching for short-circuit sites in 6-10 kV power grids. The instrument was developed by the plant jointly with the PO Soyuztekhenergo and the Ukrainian agricultural academy on the basis of the previously produced Poisk-1 and Garmonika. The experience in operating portable instruments and the desires of the power systems were considered in development of the new instrument.

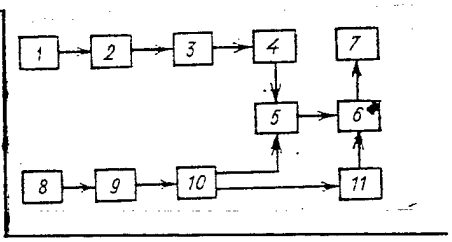
The Volna has higher sensitivity than the Poisk-1 and it is considerably smaller and lighter in weight and simpler to operate. Thanks to a special compensator, the instrument has greater selectivity, and its readings depend to a lesser extent upon the distance between the instrument and the line's wires and also upon the value of the contact resistance at the short-circuit site.

In addition to locating ground faults, the Volna permits the electrical field close to a support to be monitored, with a view to identifying reinforced-concrete supports that are live because of insulation breakdown and violation of the support's grounding, and also in order to find a place where a wire of the line has broken.

A functional diagram of the instrument is shown in figure 3. The magnetic sensor 1, which is an inductance coil with an open ferrite core, jointly with the capacitor 2 that is connected to it, form a resonant circuit that is tuned to a frequency of 550 or 250 Hz and is connected to the input of the emitter follower 3. A voltage divider 4, which enables stepped regulation of the instrument's sensitivity, is connected to the outlet of the follower 3. The signal from the divider is fed through the control unit 5 to the input of the first transistor amplifier 6, at the output of which a microammeter 7 is connected through the rectifier.

The electrical antenna 8, which is a metal plate that is built into the instrument's housing, has been connected through the emitter follower 9 to the input of the second amplifier 10. The latter has two outputs. The DC output

Figure 3. Functional Scheme of the Volna Instrument.



operates through the compensator 11 to the amplifier, which provides automatic stabilization for the instrument indications as the distance from the instrument to the wire changes, by means of a corresponding change of the amplifier's amplification coefficient during change in the voltage at the antenna.

The amplifier's AC output is fed through the control unit to the last amplifier stages, allowing the intensity of the electric field to be monitored in accordance with the instrument's indications in the mode for monitoring the presence in the network of a grounding to the earth.

A grounding fault is sought by means of the Volna in the following procedure. First, the faulty line is identified. For this purpose, the operator measures the magnetic field close to all the lines that exit from the substation's busbar. It is recommended that the measurements be made at distances of 5-8 meters from the line's axis. The faulty line will be the one with the greatest magnetic field.

After identifying the faulty line, measurements are made where the line branches. The instrument's readings for the faulty branch will be severalfold greater than for a normal branch. In order to identify the faulty branch directly at the faulty spot itself, consecutive measurements are made along this branch. Crossing the site of the fault is marked by a sharp drop in the instrument's indications.

Where there is a break in an insulator on a reinforced concrete support and a breakdown of the grounding, the support is under a phase voltage in the absence of any signs of a ground fault in the network. Such a support is a great danger to people and livestock. In order to identify live supports, instrument should be switched to the mode for measuring an electrical field and the field measured at a distance of 8-9 meters from the support. If the support is live, the instrument's readings will be substantial--more than 30 percent of the scale, but if the support is not charged, then the readings will be close to zero.

The site of a break in a wire is determined by means of sequential measurements of the electrical field along the line at a distance of 8-9 meters from the line's axis. In so doing, the instrument should be set in the mode for measuring an electrical field. The instrument's readings at the site of the break will rise sharply.

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TURBINE BLADE MANUFACTURING SCHEDULE EXAMINED

Leningrad LENINGRADSKAYA PRAVDA in Russian 5 Jul 83 p 2

[Interview with A.N. Shagin and Yu.V. Tsvetkov, fitter-assembler crew leaders, Neva Plant imeni V.I. Lenin, and V.A. Balunov, milling-machine operator crew leader, and K.M. Kulakov, shop party organization secretary, Leningrad Turbine Blade Plant, by S. Pochin; data and place not given: "A Partner's Shoulder"]

[Text] Leningrad's power machinery builders are faced with extremely complicated assignments in the third year of this five-year plan: atomic reactors, a million high-speed turbines and special gas-pumping machines. It is impossible to enumerate even the largest orders that must be filled by the labor collectives of our city. It is noteworthy that a significant part of these orders must be filled ahead of schedule, in accordance with socialist obligations.

The successful achievement of the planned goals depends primarily on the coordinated efforts of the collectives, the clarity of the interaction among them, and the efficiency and sense of responsibility of the partners. Whether or not these important conditions are fully met and which enteprises will hinder this work are the basic questions touched upon by the participants of a roll call of power machinery builders initiated by this newspaper's editorial board.

The first exchange of opinions was among representatives of the Neva Plant imeni V.I. Lenin and the Leningrad Turbine Blade Plant, who discussed a question that disturbs both sides identically: how to guarantee unconditional fulfillment of of the socialist obligations for the production ahead of schedule of the powerful GTN-25 gas-pumping machines.

In beginning this roll call, the editorial board deliberately did not give the floor to the leaders of those plants, but to those who work directly on the production of the GTN-25 in the shops and who deal every day not with plans and numbers, but with the machine itself. The following people participated in this conversation: fitter-assembler crew leaders A.N. Shagin and Yu.V. Tsvetkov (Neva Plant) and milling-machine operator crew leader V.A. Balunov and shop party organization secretary K.M. Kulakov (Leningrad Turbine Blade Plant).

Tsvetkov: As is known, the first series-produced GTN-25 machine was tested and sent off to a gas pipeline in January of this year. The rate of their production was then accelerated constantly, and now the shops engaged in the production of these units are working at maximum speed. Otherwise we will not be able to send the

pipeline builders 14 units ahead of schedule, as it says in this year's obligations for us here in Leningrad. By the way, this number surprised me at first: actually, when the five-year plan was being worked out we were charged with manufacturing just about that many GTN-25 machines during the entire 5-year period.

Shagin: When we adopted these strenuous socialist obligations in our association, many people doubted whether or not we could send so many machines out ahead of schedule. What caught our attention was that in order to achieve our goal we would have to make an unprecedented leap: it took a whole year to manufacture the first unit, but now we had to set up a conveyor-belt system and produce them one after another. Nevertheless, we were confident that we could handle this assignment. A sizable stockpile of parts and assemblies was set up. That was how we achieved a good start this year.

Now, however, this stockpile is practically exhausted. The machines on the assembly stands are being put together from parts and assemblies produced this year. Unfortunately, interruptions in providing the machines with different types of blades are having a greater and greater effect.

Kulakov: Precisely what kinds of blades?

Shagin: Primarily first- and second-stage stator blades. At the beginning of June, for example, there were none of these blades for a single one of the machines being built. We managed to get ourselves out of this complicated situation, but right now the circumstances are similar.

You, the turbine blade manufacturers, obviously know what's going on.

Kulakov: We know, but not everything. There are certain difficulties in our machine shop, but if we receive the necessary blanks from the metallurgical production companies, I can say with complete confidence that the blades will be produced on time or even ahead of schedule, because we have good memories when it comes to our obligations to our partners.

That's part of the problem, however: the metallurgists do not provide us with a steady supply of blanks. They have recently done a great deal to speed up the process: they introduced precision stamping, a furnace for directional crystallization of metal and so on. Even with these introduced innovations, however, the technological problems are still not solved completely. They apparently don't have specialists from the appropriate services who have a proper sense of persistence and urgency. Therefore, there are still a lot of rejects and the percentage of high-quality goods we receive is extremely low. In order for them to send us, let us say, one set of finished blanks, in their furnace they have to produce about three sets.

Tsvetkov: The movement "Technologists--to the Leading Edge!" was very active at the Neva Plant several years ago. It has now quieted down considerably, but I'm convinced that this was a mistake. And judging by everything, even you, the turbine blade people, could be served in good stead by a good organization for a similar competition of specialists.

Kulakov: I agree. It's unfortunate that none of the metallurgists came to this roll call.

Balunov: The question that has been raised does not concern only the metallurgists. We, the machine operators, also need the active help of technologists. Just recently the integrated work crew that I lead decided to change over to getting paid for the final result and to begin to use the so-called brigade complement in the organization of our work. It had to be calculated precisely and we had to determine what amount of work the collective had to do and what materials and labor input would be needed. The main thing, though, was to reorganize the production process for the new type of crew work. We have been waiting 4 months for the specialists from VPTIenergomash [expansion unknown] who are collaborating with us to produce these calculations, but they still haven't arrived.

True, shop technologists have done this work, but only for the GTK-10 machines. For the GTN-25 the calculation and preparation of the brigade complement proved to be a more complicated problem, so the organization of the work on the blades for this machine is still being done the way it used to be.

Shagin: When we wanted to introduce the brigade complement in my work crew 2 years ago, the problem was with materials, since the planning and dispatching office decided not to provide us with everything we needed to do the work. They still don't guarantee it. But this isn't what I'm talking about. Tell me, is the new organization of labor and wages having any effect yet?

Balunov: The time has not yet arrived to talk about a tangible effect, since we've only been using the brigade complement for 2 months. But I feel that there will be an improvement in quality and we're actually now monitoring every operation. There will be an improvement in the stability of the working rhythm and there has been a decrease in the number of sections on which we depend: we maintain our machine tools ourselves, we don't need adjusters, and we do our own drilling and grinding. The 22 men in my crew do almost all the mechanical operations for the production of the blades assigned to us. Come visit us and you'll see.

Kulakov: The example of V.A. Balunov's work crew is extremely valuable for our collective. Three-fourths of our workers are in work work crews, but it cannot be denied that many of them are not very efficient. Here's the picture: Valunov doesn't have any workers who can't meet the norms, and one who could barely earn 120-140 rubles before joining his crew now receives at least 200.

Right now another collective is changing over to the brigade complement method, and Valunov's machine operators are trying to go even further. They recently assumed increased obligations in honor of the 80th anniversary of the second party congress and the 25th anniversary of the movement for a communist attitude toward labor. By the end of the year they have resolved to finish 80 percent of next year's plan. Something can actually be learned from them.

Tsvetkov: We accept the invitation. Such a meeting can be particularly useful for the workers in our second blade shop. This collective is now preparing to convert all the work crews to payment for the final result in the very near future. By the way, it is also collaborating with VPTIenergomash.

I did not mention this shop just by accident: along with our association, it is the one charged with assembling the GTN-25 blades. However, it is having some serious

problems in carrying out its assignment, so we should not just explain the present tension in the functioning of our "conveyor belt" on miscalculations by other companies.

Shagin: Absolutely correct.

Tsvetkov: Well, here is what happened: our work crew recently finished its work on the 12th machine. You understand that each of us has his own reckoning, since we are in action at different stages. However, we sent the 10th and 11th machines to the assembly shop practically "unbladed."

Sure, our neighbors can find a whole lot of reasons that prevented them from doing their work ahead of us: not enough people, metal and so on. However, all of these reasons don't belong in the uneliminatable category. This reorganization of the work crews is capable of reducing the personnel deficit considerably if only it is done operationally and energetically.

Kulakov: These words can undoubtedly be applied to all our neighbors. Our metallurgists, shall we say, are also complaining: there's not enough metal. But then some fellows from Komsomol'skiy Projector made an unexpected visit recently and, as it turned out, there is metal! They found it in the supply department or, more precisely, in the department's documents, which said very clearly where it was and, secondly, that industrial rejects will not be used.

Shagin: And how many such discoveries could be made if we were to concern ourselves even more seriously with the technology for producing these units. I recall that last winter, at a meeting of our company's party management activists, General Director G.F. Velikanov reported that in the next 2-3 years we will be faced with the task of cutting the labor-intensiveness of the production of the GTN-25 in half. I am convinced that this goal can actually be reached even more quickly. There are still so many inadequately thought out assignments and changes and imperfections! Incompleteness of deliveries causes so much awkwardness in the work: we begin to test rotors, then dismantle them, put in the missing blades, assemble them again and start testing again.

No, the technology does not depend on the technologists alone. They should actually be the leaders, but suppliers and rate setters and foremen and, of course, we ourselves, the workers, can make a tangible contribution. Let me give you a small example to confirm this. Until recently our shop received blades from your shop that had tail pieces that were just tiny fractions of a millimeter larger than they should have been. How were they to be put into the grooves? We had to grind off these "hundredths," and every time we were afraid we would ruin the blade, because we're not specialists at that type of work, but fitters.

Kulakov: I have to explain how this lack of coordination came about. In general, I think, the fact of the matter is that our tool makers turned out to be not entirely prepared to do finishing work on "tails." Imperfect equipment complicated the matter. The situation has now changed. So how are things with you?

Shagin: Well, in the last 2-3 weeks we haven't been bothered by the "tails." What will happen in the future, I don't know.

It is unfortunate that your and our specialists have almost no direct contact. Because of this we are lacking information and elementary problems take too long to solve. So much time slips away while these problems pass through the appropriate plant services.

Kulakov: I agree.

As far as the problem of reducing labor-intensiveness as a whole is concerned, our reserves are no smaller than yours. I'm talking here about our machine shop, as well as the other shops. The metallurgists need to increase more rapidly their volume of output of blanks with minimum allowances for finishing and we need to master the highly productive equipment we've received more quickly.

Tsvetkov: Our partners are right: although on the whole the schedule for the production of GTN-25's is being observed, there is no reason for complacency. In the first place, because we still have not created guarantees for the unconditional fulfillment of this year's obligation, which is the delivery of 14 machines ahead of schedule. Much strenuous work still remains to be done on this. In the second place, we are faced with creating a reliable stockpile for the future: in 1984 we will have to produce many more GTN-25 units than we are now doing. It will be impossible to cope with this plan without thorough and serious preparations. Right now, by and large, we have not yet set about them. [S. Pochin's conclusion follows].

The first exchange of opinions in this roll call has been completed. Dissatisfaction with what has been achieved could be sensed in the statements of each of the participants, so both sides made quite a few sensible suggestions. Now it is important to put them into practice as quickly as possible.

The editorial board expects the leaders of the enterprises included in this roll call and the party organizations to inform us, on an operational basis, of the contemplated steps to be taken to accelerate the production of GTN-25 units. The successful fulfillment of this extremely important obligation by the workers of Leningrad will be a worthy answer on the part of the machine builders to the decisions of the November (1982) and June (1983) Plenums of the CPSU Central Committee.

In the continuation of the roll call of power machine builders that has been begun, the editorial board plans to let representatives of the associations of the Izhorskiy Plant and the Leningrad Metal Plant have their say in the pages of this newspaper.

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LIVING CONDITIONS FOR SIBERIA'S OIL, GAS FIELD WORKERS BEING IMPROVED

Moscow STROITEL'STVO TRUBOPROVODOV in Russian No 5, May 83 pp 6-8

[Article by V. F. Matusyak of the Blue-Collar Worker Personnel and Living Conditions Administration of Minneftegazstroy [Ministry of Construction of Petroleum and Gas Industry Enterprises]: "Improvement of Social and Living Conditions for the Industry's Workers"]

[Text] The main directions of the program for the social development of the industry were first developed before the mid-1970's. At the ministry board's instructions, various elements of the industry--main administrations, associations, construction and installing trusts and industrial enterprises--undertook to prepare plans for the social development of collectives. This important work has been conducted against a background of vigorous growth of oil and gas construction in the country and a shifting of the main volume of this work to uninhabited areas of West Siberia.

The Ministry of Construction of Petroleum and Gas Industry Enterprises, which was established in 1972, was required, simultaneously with the erection of facilities for the fuel industries, to quickly form its own mobile collectives of construction and installing organizations, to create a base for them, and to solve many problems responsively. And, among the numerous problems, the following were first in priority: the erection of housing and facilities for social and cultural purposes in regions of intensive oil and gas construction work, the creation of a stock of mobile housing for pipeline-route settlements, and so on. For the level of solution of basic social tasks greatly affects the personnel situation and the stability of production collectives. And this is especially important because of the severe shortage of labor resources in the regions where trunk pipelines are being erected and gas and oil field facilities are being built up.

Thus the ministry, on becoming the prime contractor for housing and nonindustrial construction in West Siberia, bore responsibility for the integrated development of this region. Fulfilling this task, which is extraordinary in scope, of creating the new fuel-and-power engineering complex, required the rapid establishment of collectives of highly qualified oil and gas field workers, geologists, and, of course, builders. Unfortunately, in building housing mainly for the client ministries and in striving primarily to fulfill the contracting-work plans, West Siberian organizations did not provide

adequate housing at an adequate pace for their own people. Builders who were based in the traditional areas also introduced little housing, because of limited capital investment. The collectives of specialized units that did not build housing independently found themselves in a difficult situation.

During the 10th Five-Year Plan the industry's subunits put 2,461,000 m^2 of total housing space into operation, including 1,147,800 m^2 for builders in West Siberia. Here is how the pace of West Siberian housing construction has grown: 90,000 m^2 in 1973 and 160,000 m^2 in 1975; the average annual indicator for the 10th Five-Year Plan was 230,000 m^2; and during this five-year plan more than 2.25 million m^2 of well-appointed housing are to be introduced.

In order to satisfy more rapidly the workers' requirements for well-appointed apartments, housing construction volume should rise sharply. To consider housing and nonindustrial construction a matter of primary importance and to use housing-construction capacity more completely--these are becoming the tasks of the day. All the industry's subunits, regardless of the region where they work, should pay daily attention to the construction of facilities for housing and social and cultural purposes. This refers especially to organizations that are operating in the Middle Ob region and at Nadym and Novyy Urengoy, to Glavvostoktruboprovodstroy [Main Administration for Pipeline Construction in the Eastern Economic Region] and Glavtruboprovodstroy [Main Administration for Pipeline Construction] subunits and to specialized installing organizations.

Housing conditions have improved for thousands of construction workers. Tatneftestroy [Tatar ASSR Association for the Construction of Oil-Industry Enterprises], Vostokneftestroy [Trust for the Construction of Oil-Industry Enterprises in the Eastern Economic Region] and Vostoknefteprovodstroy [Trust for the Construction of Pipelines in the Eastern Economic Region] are working actively in this direction. Workers who have been living in mobile housing within city limits are transferring to permanent-type housing. Thus, in the last 2 years, 1,260 families in Orenburg obtained well-appointed apartments, and the temporary mobile-housing settlements have been completely redeployed. Main administrations and trusts have planned measures to resettle during the current five-year plan all workers who are living in temporary housing settlements located in cities and towns of the country's central belt.

The industry's organizations and enterprises now have more than 7 million m^2 of housing, and there are 13 m^2 of total space per personel residing in the industry's housing.

The industry's housing is distinguished by a high level of construction amenities. The dynamicity in the execution of this work should be noted. Thus, during 1976-1982 the provisioning of housing with water and sewer lines grew by 10 percent, provisions for central heating by 5 percent. The number of housing units with hot-water supply has doubled. The degree of improved construction of the industry's housing reached indicators that are average for the country.

In most subunits, housing is provided to workers under the following scheme: dormitory (mobile hut)--dormitory (boarding-house hotel)--apartment of improved construction.

Providing subunits with dormitories is a serious problem. At present, organizations have at their disposal 380 fixed-type dormitories where about 80,000 workers live.

Because personnel augmentations at the industry's construction projects comprise mainly youths, special attention is being paid to building well-constructed dormitories or hotel-type boarding-house facilities. For workers who are single or have small families, the current five-year plan sets the task of building housing for 47,000 persons, 28,500 of them in West Siberia. The total for the first 2 years of the five-year plan (dormitories were built to accommodate 17,400 persons) indicates that the task set for 1981-1985 will be carried out successfully.

In order to retain young workers, hotel-type housing must be built for small families. Plans for building housing still pay little attention to them. Thus, Glavtyumenneftegazstroy [Main Administration for the Construction of Oil and Gas Industry Enterprises in Tyumen Oblast] is building only 5 percent of all its housing for workers with small families.

The most severe problem of settling single workers faces organizations of the West Siberia region. In the near future, up to 40 percent of capital investment for housing construction in these regions will go to the erection of modern, well-built dormitories.

By the end of the five-year plan it is expected that the industry will have dormitory and hotel-type boarding house space for 120,000 persons. This will completely satisfy the requirement for housing for workers who are single or have small families.

Living conditions for workers of mobile subunits that are engaged in erecting trunk pipelines, primarily the multiple-strand Urengoy-Central Economic Region system and the Urengoy-Pomary-Uzhgorod gas pipeline, remain a topic of special concern.

More than 1,100 field housing settlements and settlements for rotating-duty workers, where about 120,000 persons live, have been developed for construction of the pipeline system.

The industry is using a mobile infrastructure, which includes communities of two types: settlements for rotating-duty workers that are located close to the compressor and pump stations and at places where oil or gas field facilities are being built up; and right-of-way settlements (mobile) for workers who are building the line.

Settlements for rotating-duty workers call for housing complexes--dormitories, apartment-type housing, a domestic-services building for rotating-duty workers, treatment and preventive-medicine units with sauna baths (Tonus), dining halls, cultural and health-improvement complexes (athletic halls, swimming pools, sanitary and preventive-medicine facilities), and auxiliary production buildings.

The buildings are being erected out of highly industrialized structure that the industry has developed and learned to produce--functional modules, collapsible outfitted buildings, and so on. Transportable settlements are produced from stock modules of original design that meet the industry's special needs.

The architectural, layout and constructional solutions for housing buildings and premises call for the wide use of mobile huts for housing and domestic services, Vostok-type rotating-duty housing complexes built of prefabricated wooden structure that is either produced by the industry's enterprises or obtained from Minlesbumprom [Ministry of Timber, Pulp and Paper, and Wood Processing Industry].

For workers of mobile subunits engaged in building the Urengoy-Pomary-Uzhgorod gas-export pipeline, settlements have been outfitted with stock buildings and structures, both through redeployments from previously constructed facilities and through centralized sources.

In a short time, 78 field settlements, including 67 on the gas pipelines' right-of-way and 11 at compressor stations due for early startup, were built on the route. The buildup of settlements at another 12 KS's [compressor stations] will be completed in the second quarter of this year.

It is planned that in 1983 the industry's enterprises will send to the route more than 3,500 units of mobile housing, 2,500 modules for Voskhod complexes, 81 sixteen-unit modular-type apartment houses, 300 Tonus-type treatment and preventive-medicine modules, 200 buses for rotating-duty type workers, 10 outfitted-module athletic complexes with swimming pools, Red Corner recreation rooms, dining halls, medical-service stations and other modules for social and domestic-services purposes.

Agreements have been concluded with domestic-services combines of cities and settlements at the places of deployment. Hairdressers' and shops for repairing footwear, clothing and household appliances have been opened up for the builders, and rental centers, drycleaning shops and laundries are operating.

A program that has been worked out for establishing stationary and mobile urban-type and rotating-duty settlements for 500-1,500 residents will enable, for the first time in practice, the problems of habitation for construction workers, their recreational, physical cultural and sports pursuits and the organizational of educational work to be solved in integrated fashion under pipeline right-of-way construction conditions.

Work on further developing a network of children's preschool institutions and improving the system of preschool rearing has become an important part of the social program.

It is planned to build during the 11th Five-Year Plan nursery-kindergartens to accommodate 14,120 children. During 1981, under a plan for introducing facilities for 3,020 children, facilities for 3,820 (126.4 percent) were introduced; during 1982, under a plan for facilities for 2,390, facilities for 3,195 were introduced (133.6 percent); and in 1983 it is planned to introduce nurseries and kindergartens for 2,290.

During the five-year plan as a whole, nurseries and kindergartens for 9,825 children should be erected in West Siberia.

The industry's organizations in the Ukraine and the Turkmen SSR have been provided completely with nursery and kindergarten facilities. There is practically no waiting list for preschool institutions in Glavkomigazneftestroy [Main Administration for the Construction of Oil and Gas Industry Enterprises in the Komi ASSR], Tatneftestroy [Association for the Construction of Oil Industry Facilities in the Tatar ASSR], and Soyuzremonttruboprovodtekhnika [All-Union Association for Pipeline-Machinery Maintenance]. However, for the industry as a whole, accommodations are still required for 34,400 individuals, including 20,600 of them in West Siberia.

Most preschool institutions are buildings that are constructed according to modern standard designs. Each year appropriations are increased for the care of children, and capital investment for the construction of preschool institutions is being increased.

At the same time, there is still a large amount of important uncompleted work in this essential area. Some children's institutions lack the required set of rooms. Plans to build preschool institutions are not being outfitted by a number of main administrations and associations (Glavurengoygazstroy [Main Administration for the Construction of Gas Industry Facilities at Urengoy] and Glavtyumentruboprovodstroy [Main Administration for Pipeline Construction in Tyumen Oblast]), and overhaul is being done slowly (Glavkomigazneftestroy].

Sometimes facilities are presented for turnover with a large number of deficiencies, as a result of which they are not operated for a long time. Thus, a nursery-kindergarten for 280 children in Surgut was turned over on 25 December 1981, but its opening was delayed for a year. In the cities of Nizhnevartovsk, Novyy Urengoy and Kharp, institutions of this type that were turned over in the past year have been only half functioning. And this in West Siberia, where the need for preschool institutions is especially great.

Serious attention is being paid to the use of summer vacations for the labor, political and ideological education of schoolchildren. The industry now has 23 Pioneer camps (for almost 6,000 children), 18 of them in permanent-type buildings. Moreover, 31 organizations are renting 33 Pioneer camps that are being used simultaneously by 7,420 vacationing workers. This will enable recreation for about 40,000 children to be organized each year.

It is planned to build during the 11th Five-Year Plan Pioneer camps that will accommodate more than 5,500 children. The construction will be executed primarily by the industry's enterprises and organizations in West Siberia.

A good example of the execution of a set of measures for the social program among organizations employed in the West Siberian region is the activity of the Sibkomplektmontazh [Association for the Erection of Outfitted-Modular Units in Siberia] collective. A number of vitally important questions that are of paramount significance in establishing a collective of many thousands of persons were basically resolved here in an exceptionally short time--in 4-5 years.

Sibkomplektmontazh is distinguished right now by the lowest personnel-turnover rates--both in the arrival and departure of workers--among West Siberian organizations. Personnel turnover has been reduced by 18 percent in 5 years.

The results of fulfilling the broad social program were a significant increase in the amount of housing and practically complete satisfaction of the requirement for the necessary children's institutions.

However, with the association's rapid growth, the housing inventory should be expanded correspondingly.

The association's microrayon in Tyumen right now has 7 hotel-type boarding houses, 3 dormitories and 5 apartment houses. In operation here are a dining hall, 3 children's combines, a delicatessen, clubs for youths and children, and a store for foodstuffs, manufactured consumer goods and vegetables. There is a general education school. At the apartment houses and dormitories there are equipped and well-constructed children's playgrounds, the athletic fields, and a skiing base.

With a view to improving indoctrinational work in the dormitories and at the places of residence, a methodics council, backed by a methodics office, is in operation.

During the summer of 1982 more than 1,600 children attended Pioneer camps, and, moreover, 330 school-age and preschool-age children, together with their parents, vacationed at tourist centers and at vacation housing or received treatment in sanatoria.

The Sibkomplektmontazh Association, being a subcontracting organization, is especially severely confronted with the problem of siting the installing collectives at facilities. Field settlements of two basic types are being used: those close to the city (a workers' settlement) for deployment of workers of northern PMK's [mobile mechanized columns], and settlements for rotating-duty subunits. In 1982 an additional 7 mobile-housing settlements of the fixed type, where 3,500 people reside, were equipped for the workers of northern subunits.

The results of recent years testify that much has been done in the main areas of the program for the social development of collectives.

Mobile construction and installing subunits that are successfully carrying out the growing program of operations have been created in various parts of the country in a short time.

Especially large is the detachment of builders of oil and gas field facilities in West Siberia, where the ministry's main work volume is being performed at present. Tyumen Oblast has the main share of the program for building housing and facilities for cultural and domestic-amenity purposes.

However, not all the measures specified by the program are being carried out successfully: the provisioning of well-appointed and mobile housing and children's preschool institutions is inadequate, and the network of sanatoria and health-maintenance facilities is being expanded slowly. Still greater efforts to implement these measures are necessary.

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EFFORTS TO UPGRADE SKILLS, RETRAIN OIL, GAS FIELD WORKERS TOLD

Moscow STROITEL'STVO TRUBOPROVODOV in Russian No 5, May 83 pp 8-10

[Article by L. M. Kudryavtsev of the Administration of Managerial Personnel and Training Institutions of Minneftegazstroy [Ministry of Construction of Petroleum and Gas Industry Enterprises]: "A Rise in the Stability and Qualitative Composition of Engineering and Technician Personnel"]

[Text] Important structural changes have occurred in the industry in recent years, and the number of new construction, installing and other types of organizations has grown. In the last 5 years alone, 11 main administrations, 5 associations and 46 trusts have been created.

The ministry, main administrations and associations are paying great attention to strengthening organizations (especially newly created ones) with personnel and to manning them with skilled specialists.

From year to year the qualitative composition of managerial engineers and technicians (ITR) is being improved. Today, more than 27,000 of them have a higher education, 30,000 a secondary education. Since 1980 the total number of engineers and technicians has increased by 7,500, and the number of such persons trained on the job has decreased by 1.4 percent.

All the chiefs and chief engineers of main administrations, associations and trusts and more than 80 percent of the trust managers have a higher education. Of the chiefs and chief engineers of construction administrations, 97 percent of them have specialists' degrees.

An important task is that of strengthening organizations engaged in developing the West Siberian oil and gas complex.

Glavurengoygazstroy [Main Administration for the Construction of Gas-Industry Enterprises in Urengoy], Glavtyumentruboprovodstroy [Main Administration for Pipeline Construction in Tyumen Oblast] and Glavzapsibzhilstroy [Main Administration for Housing Construction in West Siberia] have been manned with supervisory personnel mainly by promoting local workers who have proved themselves positively in production work.

Up to 2,000 vuz and tekhnikum graduates are sent each year to the industry's organizations. They are distributed among organizations in accordance with the plans, preference being given to newly created organizations and those located in West Siberia. In 2 years, 2,300 young engineers and technicians have been sent to this region.

Measures are being taken to retain the young specialists and to improve their utilization. For the most rapid mastery of production work and acquisition of practical skills, each year more than 600 young engineers are given on-the-job training in the positions they hold. The on-the-job training is managed by experienced engineer-mentors, who, jointly with the councils of young specialists and social organizations, help the young workers' creative growth.

Seminars of young specialists and scientists are aiding to a great extent the youths' wide involvement in scientific and technical creativity. These are held once in 2 years, in 3 stages: for the trusts and enterprises, for main administrations and associations, and for the ministry as a whole.

Some organizations do not have enough engineers. At the same time, many specialist engineers and technicians are being used where performance of the work does not require high technical knowledge on the part of the supervisors.

The ministry is taking steps to improve the utilization of engineers and technicians and to retain them in production operations.

The inclusion of engineers and technicians in the staffs of spreads affects the stability of such workers in a positive fashion. The spread form of organizing production, together with an increase in material incentives for specialists, will enable their knowledge and experience to be used more completely and high labor productivity to be achieved.

The industry is training specialists for the middle echelon. In four tekhnikums, 6,600 people are being taught. Each year about 1,450 are graduated in 12 applicable specialties.

In 1981 a new construction-work tekhnikum was organized in Tyumen. It is readying building technicians and mechanics for the erection of pipelines and welding-operations technicians and manufacturing technicians for the production of constructional structure and articles.

Some tekhnikums have organized anew the training of specialists in the monitoring of metals and welded-joint quality, automated electrical communications, and the operation and repair of construction machinery.

The training aids base for the tekhnikums is being strengthened, and shops are being equipped. Offices and laboratories are being supplied with modern equipment, instruments and visual aids. The undergraduate theses of the students have become more diverse, and they correspond more completely to the nature of the construction operations.

In order to improve the training and provisioning of the industry with engineering personnel, a training building for the Tyumen Construction-Engineering Institutes has been built, and facilities for a number of other institutes are being erected.

The ministry is operating a system of personnel retraining. Each year the Institute for Raising Qualifications and its branches are retraining 5,500 workers of the industry in classes at tekhnikums, vuz departments and training

centers of other agencies. About 2,000 people are raising their skill levels without interrupting their production work.

In 1981-1982, under the program, "Improvement of the Management Mechanism," 95 trust managers and a large group of supervisory workers of main administrations, associations and the ministry's staff underwent training that took them from their work. In 1983, the chief engineers of trusts will be trained under this program.

The education of workers in a proprietary attitude toward social property and in skill in making use of existing resources to maximum advantage is helping in the economic education of personnel.

Economic study has, in various forms, covered 124,000 workers and more than 43,000 supervisors, engineers, technicians and white-collar workers. Each year more than 500 propagandists and supervisors of economic-education councils of organizations and enterprises are given full-time instruction off the job in the system for raising skill levels.

The ministry's Council on Education in Economics, which supervises economic training, extends methodics assistance to main administration and association councils and receives their reports about their work.

In solving problems of training and retaining personnel and strengthening educational work, the ministry is increasing its exactingness towards personnel and their responsibility for the matter entrusted to them.

Reports of supervisors about the state of performance discipline in Glavtyumenneftegazstroy have been heard at the ministry's board, and measures for further strengthening labor discipline, reducing personnel turnover and improving the monitoring and checking of the adopted decisions have been examined.

The industry's working collectives are implementing measures aimed at improving the state of organization and coordination and eliminating nonproduction-time losses. The drive against mismanagement and extravagance has been intensified.

In some organizations the required stability of the collectives still has not been achieved. There is high personnel turnover in units of Glavvostoktruboprovodstroy, Glavtyumenneftegazstroy, Glavtyumenneftegazstroy [Main Administration for Construction of Oil and Gas Enterprises in Tyumen Oblast], Surgutspetszhilstroy [Surgut Trust for Special Housing Construction] and Urengoygazzhilstroy [Trust for Housing Construction for Urengoy Gas Industry Enterprises].

Often an inattentive attitude toward the use of young specialists and toward creating the required housing and living conditions for them leads to dismissals. Complaints on these questions come from organizations of Glavzapsibzhilstroy, Glavneftetazstroy [Main Administration for the Construction of Oil and Gas Industry Enterprises, Glavsibtrubuprovodstroy [Main Administration for Pipeline Construction in Siberia] and Glavtruboprovodstroy [Main Administration for Pipeline Construction].

Trusts and administrations are not doing enough work to create an effective reserve of personnel for promotion. Certification and the system of retraining are being poorly used for identifying and training able workers.

Some main administrations, associations and trusts are not insuring the fulfillment of tasks on sending specialists for training, and the industry's Institute for Raising Skill Levels and its branches are not meeting the requirements for manning the training groups. For this reason, a portion of the engineers and technicians are not augmenting their knowledge, so they lag behind modern requirements for organizing production and for scientific and technical progress.

Steady growth in personnel qualifications and increase in the responsibility of personnel for the assigned job are among the chief tasks that face the supervisors of personnel services for all the industry's subunits. The solution of these problems will help greatly in successful fulfillment of plans and socialist commitments for 1983 and for the five-year plan as a whole.

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PERSONNEL SITUATION OF TRUNK PIPELINE BUILDERS DISCUSSED

Moscow STROITEL'STVO TRUBOPROVODOV in Russian No 5, May 83, pp 10-12

[Article by N. Ya. Rusanov of the Administration for Blue-Collar Workers and Living Conditions of Minneftegazstroy [Ministry of Construction of Petroleum and Gas Industry Enterprises]: "Improvement of the Socio-Demographic Structure of Organizations and Problems of Blue-Collar Worker Support"]

[Text] Despite the sharp reduction of personnel losses in the industry as a whole in recent years, personnel turnover still remains substantial.

In organizations of Siberia's North and West, blue-collar worker personnel with continuous service of more than 3 years is one-half to one-third that of workers with less service. Thus, in Glavtyumenneftegazstroy [Main Administration for the Construction of Oil and Gas Industry Enterprises in Tyumen Oblast] blue-collar workers were categorized as follows by length of service in 1982:

less than 1 year	52.1 percent
from 1 to 3 years	29.5 percent
from 3 to 5 years	12.2 percent
more than 5 years	8.2 percent

and the number of blue-collar workers discharged had served as follows:

less than 1 year	70.3 percent
from 1 to 3 years	20.6 percent
from 3 to 5 years	7.4 percent
from 5 to 10 years	1.7 percent

Those discharged who had not worked out 1 year were basically youth: in Surgutgazstroy [Trust for the Construction of Gas Industry Enterprises in Surgut] the figure was 49.4 percent, in Megiongazstroy [Trust for the Construction of Gas Industries in Megion] 49.8 percent. Reductions in the number of discharges of workers with work service of less than 3 years were achieved by Glavtruboprovodstroy [Main Pipeline Construction Adminstration], Glavukrneftegazstroy [UkSSR Main Administration for the Construction of Oil and Gas Industry Enterprises], Glavneftegazmontazh [Main Administration for the Installation of Oil and Gas Facilities], Tatneftestroy [Tatar Association for the Construction of Oil Industry Facilities] and Sibkomplektmontazh [Siberian Association for the Installation of Outfitted Modules].

A trend has been noted in the industry toward an increase in the average age of blue-collar workers, especially in organizations located in the European part of the country. For the ministry as a whole, the most numerous age group of workers is 30-39 years.

Among those being discharged are many bachelors. They easily change not only place of work but also place of residence. Among the reasons for their discharges are difficulties in obtaining separate living quarters. An expansion of the construction of hotel-type housing would enable turnover among this worker category to be reduced.

During the past 10 years the cultural and technical level of the industry's blue-collar workers has risen. During this period the proportion of workers who have higher or secondary special education increased. The number of blue-collar workers with secondary education rose more than 1.5-fold (from 17.9 to 28.1 percent of total manning of workers employed in the industry).

The educational level of blue-collar workers within organizations deployed in North and West Siberian regions is much higher than in subunits in the southern and mid-European parts of the country. The industry's northern construction projects are augmented basically with youth, who have a higher education. In the northern trusts of Spetsneftegazstroy [Trust for Special Oil and Gas Industry Construction] and Komsomol'sktruboprovodstroy [Komsomolsk Pipeline Construction Trust], those who do not have a secondary education are, respectively, 35 and 40.7 percent of the blue-collar workers, while in trusts of other regions the figures are: Soyuzgazspetsstroy [All-Union Association for Special Gas-Industry Construction] 68.2 percent, Uralneftegazstroy [Urals Trust for the Construction of Oil and Gas Industries in the Urals Economic Region] 65 percent, Ryazan'truboprovodstroy [Ryazan Pipeline Construction Trust] 78.1 percent, 25 percent of them being young workers, less than 30 years old.

The highest educational level is in Urengoygazstroy [Trust for Gas-Industry Construction in Urengoy], where 92.5 percent of the blue-collar workers have at least a secondary education.

Of the leading trades, those with the most education are the welders, equipment operators and flaw detector operators.

Years of observation allow this conclusion to be drawn: the annual work done by a basic blue-collar production worker with a 10-year education is 1.5-fold more effective than that of one who has 8 years of education. Consequently, the increase in worker education is a reserve for high operating effectiveness.

The introduction of new equipment and advanced work methods at the ministry's construction projects raises the requirement for the vocational qualities of blue-collar workers. This, in turn, places its stamp on the structure of training for the industry's blue-collar work force.

The average rating of the industry's blue-collar workers rose from 3.66 in 1975 to 4.0 in 1982. Workers of the 4th to 6th categories comprise about 50 percent.

Definite successes have been achieved in training equipment operators in the maintenance of the complicated construction equipment. In Chelyabinsk and suburban Moscow schools for equipment operators, 8,500 persons were given the additional training in 1½ years. These training institutions overfulfilled 1982 plan tasks despite a 4-fold increase thereof over 1980's.

Matters are going worse with the training of blue-collar workers for other specialties, particularly welding-operations specialists. Introduction of the Pavlo-Posadskiy complex solves this problem to some extent. After 1983 the erectors of all specialized subunits will have undergone the training. The conduct of a large number of courses with the participation of foreign-firm suppliers is called for.

Experience of recent years indicates that training a large number of workers and raising the quality of worker training within a short time can be done only through centralization. This principle must be used in training specialists in welding.

The workers of this trade are now trained mainly at the Ufa Welders' School of Nefteprovodmontazh [Trust for the Erection of Oil Pipelines], where about 900 overhead welders are taught each year. This school has a good training-aids base, highly qualified instructor personnel and experts in production training: veterans of the industry and instructors with more than 10 years of service.

There are a number of training sites where electrical welders are being trained in small groups. However, these places are, as a rule, poorly provided with the required materials and do not have dormitories. The quality of the training here does not meet modern requirements, and the cost is 1.5-fold to 2-fold higher than at Ufa.

The establishment at the Ufa base of an industry-sponsored center for training welding operations specialists will enable as many as 1,500 overhead welders (out of a total requirement for 2,000), 500 defectoscope operators, and 300 brigade leaders to be trained each year within a short time and at minimal expense in materials.

The training of specialists to service welding equipment, as well as training to raise the skill levels of engineers and technicians, should also be organized here. Simultaneously, the center should execute methods supervision over branches established in the trusts and over retraining and recertification of welding operations specialists.

The Administration for Blue-Collar Worker Personnel and Living Conditions has developed a plan for reorganizing the industry's whole system for training, which calls for intertrust training combines for subunits with low manning levels.

It is proposed to greatly expand the network of large main-administration training-center combines capable of training about 1,500 people per year.

It is proposed to train blue-collar workers of the main construction trades (operators for pipelaying cranes, bulldozers, truck cranes and excavators,

electrical and gas welders, defectoscope operators, brigade leaders and so on) in ministry technical schools, which will graduate from 2,000 to 4,000 persons each annually. Groups of these schools' instructors should train more than 7,000 workers each year directly on the right-of-way.

All current training for blue-collar workers will be conducted through a network of evening sections under GPTU's [city vocational and technical schools] and trust training centers.

Special attention is now being devoted to training such a category of workers who are important to production as brigade leaders. Already this year it is planned to bring their numbers up to 2,000 (in 1982, 800 brigade leaders underwent training).

New methodics recommendations and special training aids are being developed.

Each year 30,000 workers in the industry now undergo training, and 35,000 are raising their qualifications. By the end of the five-year plan, basically by rebuilding the training structure and reorganizing the network of UKK's and training centers, it is planned that these indicators will be increased to 35,000 and 50,000, respectively.

The system of vocational training of workers in production work plays an important role in solving the problems of systematic support for the ministry's organizations with qualified worker personnel and of raising the trades skills and the cultural and technical level of blue-collar workers.

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WORK ON WEST END OF GAS PIPELINE TO WESTERN EUROPE DESCRIBED

Moscow STROITEL'STVO TRUBOPROVODOV in Russian No 5, May 82 pp 8-10, 12-13

[Article by N. D. Sokolov: "The Country Needs Shock Work"]

[Text] On the western wing of the export trunk pipeline.

Day by day the trunk line rises higher and higher into the Carpathians. The electrical welders' flames burn at the summits, the rumble of powerful bulldozers and excavators interrupts the noise of the mountain streams, and pipeline section carriers, carefully bringing pipe for the channel of the future gas arterial, creep along sharp slopes. Three operating flow-line groups of the Carpathian Pipeline Construction Trust are the ones who are storming the Carpathians. The section being erected by envoys from the GDR abuts it from the east. Specialists from the Polish Energopol' Association have been charged with laying the finishing segment of the trunk pipeline to the USSR's western border.

It would seem that the Mir, Druzhba, Bratstvo and Soyuz concepts have been materialized in the strands of the gas and oil pipelines and the high-capacity electric-power transmission line.

The emblem depicted on the sides of the heavy pipeline carriers from the German Democratic Republic, "The gas trunk pipeline is the main job of the youth of the SSNM [Union of Free German Youth]," has become well known to Carpathia's residents. This same emblem and the blue pennant of the Union of Free German Youth can also be seen at the pipe-welding base in Berezovka, at the construction sites of compressor stations and of apartment houses in Borogodchany and Volovets, and at the erection site of the gas pipeline's aerial crossing of the Dnestr.

GDR envoys are operating in four oblasts of the Ukraine. They have been charged with laying 140 km of pipeline, erecting 3 compressor stations and building tens of facilities for cultural, domestic-amenity and economic purposes. Five years ago GDR representatives did shock work in erecting the Soyuz gas pipeline in Cherkassy Oblast, where they coped with the tasks ahead of schedule. The German builders are successfully applying to the new trunk line the experience acquired during erection of the "friendship route." Supporting the slogans of their neighbors, workers from the Transcaucasus, the

German builders are toiling under the slogan, "Each kilometer of pipeline is to be laid ahead of schedule!"

Many of those who built the Soyuz are today working on the export trunk route. These include welders from Hans Gunther Reibling's brigade, the installers' brigade of Ditmar Bok and the concrete workers' brigade of Herbert Bot, who are laboring to build housing in Bogorodchany. Work is going on full blast over the whole length of the GDR section, from Bogordchany to Gusyatin. Pipe is being welded into sections at a strenuous pace at the welding base at Berezovka.

One of the more complicated engineered facilities on the Germans' segment of the export trunk line is the aerial crossing of the Dnestr. Supervising the workers here is Tomas Herold--a recent graduate of MINKh i GP [Moscow Institute for the Petrochemical and Gas Industry imeni Akademik I. M. Gubkin]. The powerful piledriver on which Gunther Foz works (he has never worked on such a construction project before) steadily pounds on the cap of the pile, forcing it into the river bed. Alongside here is a small concrete-and-mortar unit. The next structures are being readied in stock formwork. Soon, pipe 1,420 mm in diameter will rest reliably on reinforced-concrete supports. The bridge for the gas pipeline will be constructed ahead of schedule.

Work on the erection of a compressor station is going on full blast in the Volovets region in the Carpathians. The below-grade work here is being supervised by the young communist Rheiner Grimm. The first multiple-unit apartment house erected by the construction workers from the GDR has risen up in the rayon center. Construction of a building for a school is being brought close to completion and a second apartment house has been turned over for the finishing work.

The builders from the GDR have arranged for close production and fraternal ties with the collective of the Transcaucasus Pipeline Construction Administration. The Transcaucasians have helped their German colleagues in arranging for a welding platform. In their turn, German drivers have hauled pipe on their pipeline-length carriers for many a kilometer to the Zaktruboprovodstroy [Transcaucasian Pipeline Construction Administration] segment.

Segments of different lengths have been assigned to the three flow-line operating groups of Armenian construction workers. The section in Ivano-Frankovsk Oblast erected by the first spread under S. V. Gevorkyan was about 100 km long. The eastern wing of the segment has already been completed. And so the right-of-way settlement Erzrum, close to Yasinya, is deserted. The spread's main forces are now based in Vygod settlement, 60 km from Ivano-Frankovsk. All the work is concentrated on the western wing, which is complicated mountainous terrain. The second flow-line operating group, which R. Mushkambaryan supervises, has come right up to the mountain summits from the Transcarpathian direction. The welding base has also been moved closer to the mountains. It is now at Obva. What is more, only the motor pool was left in the Russkiye Komarovtsy settlement. One of the boarding hotels, which were vacated between seasons, was taken away for the construction workers.

But for all that, the most complicated section fell to the lot of the third, F. Sadriyev's spread, which is filling the gap for the whole line being erected by Transcaucasia'a construction workers.

This segment of the gas trunk line had to be laid under unusual geographic and weather conditions. The route passes directly along the mountains, without bypassing the summits. Unlike the Druzhba and Soyuz pipelines that have already been laid here in the Carpathians, which bypassed many ravines, rocks and water obstacles, the new arterial goes practically straight. The builders do not have time to make loops in the mountains, so they chose an expedient route. The mountain route must be completed by the start of July, a month ahead of the established deadline, and the facility turned over for blowing-out and testing.

The unfavorable terrain conditions are not affecting the pace--the builders' experience and skill and better provisioning of materials and equipment are helping the builders out.

From Slavska, where the third spread settlement is located, is no more than 10 km to the line, but what kilometers! On the ascents, tractors have to take in tow the powerful pipe-carriers that deliver the pipe here from the Tukhli Railroad Yard. And the welders are working on the summits. The spread has four erecting brigades, each of which is split in two. One of the collectives goes a little bit ahead, welds pipe into two-pipe sections and leaves them on the route. A second collective follows, welding the pipeline strand from the sections previously prepared. A second, similar pair moves to meet them from the other end of the segment. This method already proved itself well during laying of the Soyuz and Bratstvo gas pipelines through Carpathia. Each welder who works in the brigade does an average of one joint per shift, whereas the norm is 0.8 of a joint. The result is quite good.

The spread collective pays great attention to the quality of the trunk line that is being erected. For the gas pipeline will operate under high pressure, and the quality of the welding and insulating should be irreproachable. Specialists of the field-test laboratory check each joint. Experienced defectoscope operators V. Marsinkevich and V. Pilipiv work well.

With the appearance on the route of pipe with factory-applied insulation, it has become easier to work, since on the mountain slopes, where the dope gang columns cannot pass, the work had to be performed manually. However, during the long haul, the factory-applied insulation is damaged here and there, and these spots have to be repaired. A large number of rush matts have been shipped to Slavsk from Astrakhan. This material is intended to create a "bed" under the pipeline, which is being laid on rocky ground. The mats are laid in the bottom of the ditch and they cover the top of the pipe, to keep the backfill soil and rock from damaging the insulation. Zh. Dzhulakyan's brigade is performing these operations.

In February the most complicated section was covered: a boggy depression and a mountain with the gloomy name of Mogila[Grave], which looks, on a relief map of the route, like a narrow, tapering tooth that points upward. New experiences await the people and the equipment. But great work experience in the mountains and the good working spirit of the collective is a guarantee that the line will be turned over on time.

Specialists from Poland's Energopol' Association have arrived, to build their segment of the export trunk pipeline. Their settlement is located half-way between Mukachevo and Uzhgorod. From the road that joins these cities to the USSR's western border--this is the Polish builders' route.

The continuation of the Urengoy-Pomary-Uzhgorod Trunk pipeline will be the fourth strand of trunk pipeline to transit the land of fraternal Czechoslovakia. At the initiative of the newspapers KOMSOMOL'SKAYA PRAVDA, MLADA FRONTA and SMENA, an agreement was signed for collaboration on the Siberia-West Europe gas pipeline by the young Soviet and Czechoslovak construction workers. The line will run for 857 km over Czechoslovak territory. And beyond lies its path to the GDR and Yugoslavia and the countries of Western Europe. In January 1984 the first cubic meters of the blue fuel will go to the compressor station at Velka-Kapushan, close to the Soviet-Czechoslovak frontier, signifying the start of deliveries within the framework of the "gas-for-pipe" contract.

Work is going on full blast on all segments of the great construction project. The builders' decision is firm--to turn over, on time, the export gas pipeline--one of the central construction projects of the 11th Five-Year Plan.

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